Antic™

The ATARI® Resource

JUNE 1983, VOLUME 2, NUMBER 3

SNEAK PREVIEW NEW ATARI® LINE page 18



DATA BASE SURVEY

Game—Lone Eagle's Revenge

Player-Missile Movement

CAN A COMPUTER MAKE YOU CRY?

Right now, no one knows. This is partly because many would consider the very idea frivolous. But it's also because whoever successfully answers this question must first have answered several others.

Why do we cry? Why do we laugh, or love, or smile? What are the touchstones of our emotions?

Until now, the people who asked such questions tended not to be the same people who ran software companies. Instead, they were writers, filmmakers, painters, musicians. They were, in the traditional sense, artists.

We're about to change that tradition. The name of our company is Electronic Arts.

SOFTWARE WORTHY OF THE MINDS THAT USE IT. We are a new association of electronic artists united by a common goal — to fulfill the enormous potential of the personal computer.

In the short term, this means transcending its present use as a facilitator of unimaginative tasks and a medium for blasting aliens. In the long term, however, we can expect a great deal more.

These are wondrous machines we have created, and in them can be seen a bit of their makers. It is as if we had invested them with the image of our minds. And through them, we are learning more and more about ourselves.

We learn, for instance, that we are more entertained by the involvement of our imaginations than by passive viewing and listening. We learn that we are better taught by experience than by memorization. And we learn that the traditional distinctions — the ones that are made between art and entertainment and education — don't always apply.

TOWARD A LANGUAGE OF DREAMS. In short, we are finding that the computer can be more than just a processor of data.

It is a communications medium: an interactive tool that can bring people's thoughts and feelings closer together, perhaps closer than ever before. And while fifty years from now, its creation may seem no more important than the advent of motion pictures or television, there is a chance it will mean something more.

Something along the lines of a universal language of ideas and emotions. Something like a smile.

The first publications of Electronic Arts are now available. We suspect you'll be hearing a lot about them. Some of them are games like you've never seen before, that get more out of your computer than other games ever have. Others are harder to categorize — and we like that.

WATCH US. We're providing a special environment for talented, independent software artists. It's a supportive environment, in which big ideas are given room to grow. And some of America's most respected software artists are beginning to take notice.

We think our current work reflects this very special commitment. And though we are few in number today and apart from the mainstream of the mass software marketplace, we are confident that both time and vision are on our side.

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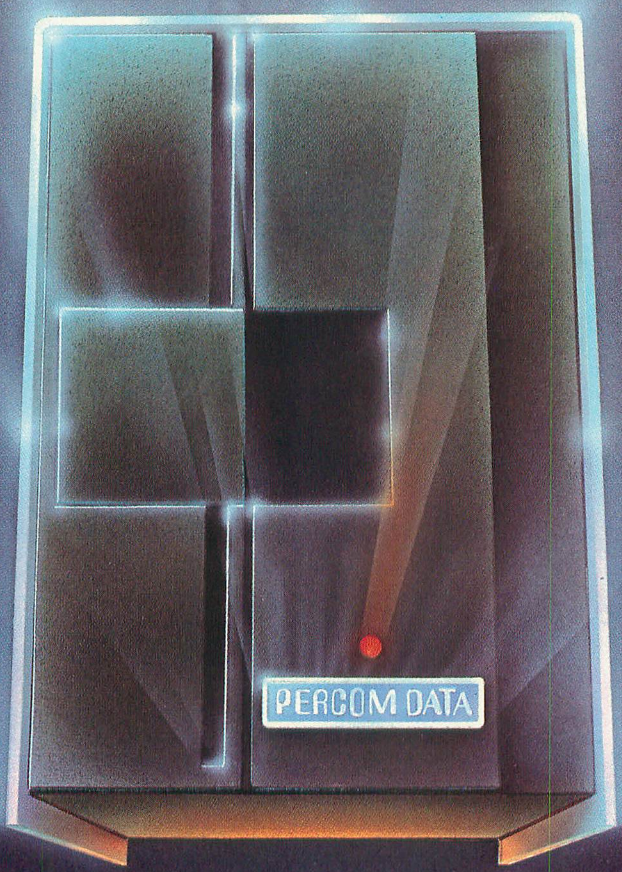


SOFTWARE ARTISTS? "I'm not so sure there *are* any software artists yet," says Bill Budge. "We've got to earn that title." Pictured here are a few people who have come as close to earning it as anyone we know.

That's Mr. Budge himself, creator of PINBALL CONSTRUCTION SET, at the upper right. To his left are Anne Westfall and Jon Freeman who, along with their colleagues at Free Fall Associates, created ARCHON and MURDER ON THE ZINDERNEUF.

Left of them is Dan Bunten of Ozark Softscape, the firm that wrote M.U.L.E. To Dan's left are Mike Abbot (top) and Matt Alexander (bottom), authors of HARD HAT MACK. In the center is John Field, creator of AXIS ASSASSIN and THE LAST GLADIATOR. David Maynard, lower right, is the man responsible for WORMS?

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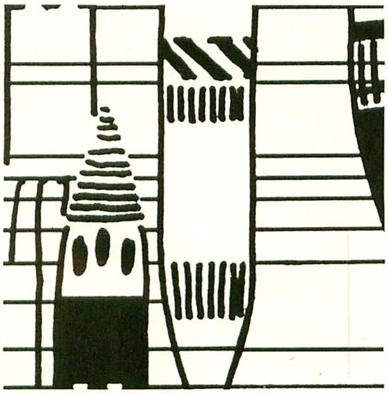
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SNEAK PREVIEW
NEW ATARI LINE page 18

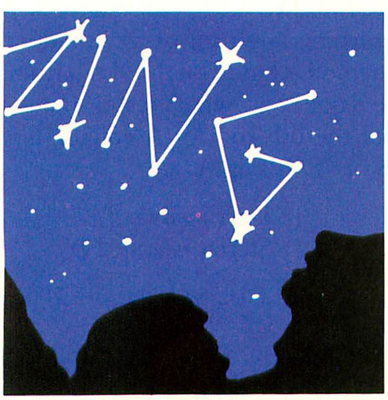
Antic™

The ATARI® Resource

JUNE 1983, Volume 2, Number 3







FEATURES

DEPARTMENTS

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I/O BOARD

REACTION

Your new program listing approach contains two elements that have a tendency to increase the typing error rate, at least for me. When looking for erroneous entries, I check to see that the line wraps at the correct point, and that the last character of a logical line aligns with preceding lines. Your new "typeset listings" violate the conditions that allow me to proofread listings using my technique.

I thoroughly enjoy ANTIC, and am very happy to see you are going monthly. Please give some thought to my reaction to your new format.

Curtis P. Hedman
Saint Paul, MN

Your solution requires true monospacing for all characters, including punctuation and the "custom" graphics set. There is no such font yet available. —ANTIC ED

CONTRIBUTION

I have come up with a neat little program that displays GTIA Mode 11. The listing looks simple, but it draws a complex picture. Here is the program:

Tim Miltz
Indiana, PA

```
10 X1=0:X2=80:Y1=0:Y2 =192:
   GRAPHICS 11
20 X1=X1+1:X2=X2-1:Y1=Y1+
   1:Y2=Y2-1
30 IF Y2=0 OR Y1=192 THEN X
   1=20:X2=60:Y1=48:Y2=144
35 IF X1>=80 THEN X1=79
40 PLOT X1,Y1:DRAWTO 80-X1
   ,192-Y1
60 PLOT X1,Y2:DRAWTO 80-X1
   ,192-Y2
65 IF X2=0 THEN X2=1
70 PLOT X2,Y1:DRAWTO 80-X2
   ,192-Y1
80 COLOR C:C=C+1:IF C=15 T
   HEN C=1
90 GOTO 20
```

RECREATION

I recently received an ATARI 800 for Christmas, and every day after school I use it. Here is a program I wrote myself. I got the idea from your issue on Sound and Music. I call it the TMT SPECIAL. Hope you like it.

T. Michael Tebo
West Chester, PA

```
  5 REM **TMT SPECIAL **
 10 GRAPHICS 3+16
 20 FOR A=0 TO 2
 30 COLOR A
 40 FOR B=1 TO 15
 50 FOR C=2 TO 14 STEP 2
 60 SETCOLOR 4,B,C
 70 SOUND 0,B*C,10,8
 80 SOUND 1,210-B*C,10,8
 90 PLOT B,C:DRAWTO C,B
100 PLOT 11+B,4+C:DRAWTO 1
    1+C,4+B
110 PLOT 21+B,C:DRAWTO 21+
    C,B
120 FOR W=1 TO 25:NEXT W
130 NEXT C
140 NEXT B
150 NEXT A
```

ROOT FUNCTION

I am a high school freshman. My interest in math, and the lack of any root function in ATARI BASIC other than square root, led me to create a method of returning any root of any number. My method is based on the "Logarithm of the Root Law" which states that the Log of the Bth root of A equals (Log A)/B or (1/B)Log A.

Darron Bacall
Staten Island, NY

```
 10 REM CALCULATION OF THE
    X ROOT OF N
 20 ? "↖CLOG OF THE X ROOT
    OF N=(1/X)*CLOG(N)":?
 30 ? "N=";:INPUT N:?
 40 ? "X=";:INPUT X:?
 50 ? "(1/X)*CLOG(N)=";
 60 Y=(1/X)*CLOG(N)
 70 ? Y:?
 80 W=10 ^ Y
 90 ? "THE X ROOT OF N =";
100 ? W
```

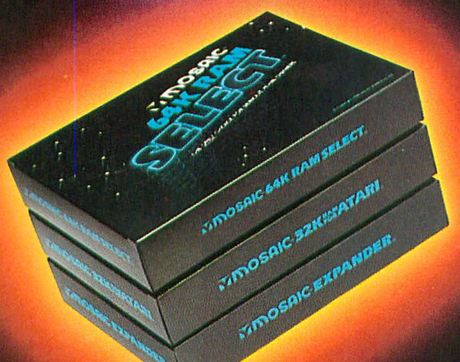
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MODULATION

I am learning Assembly Language, and am trying to design a new game. I can't figure out how to change graphics modes while under the power of the Assembler Editor cartridge.

Chris Voigt
Shoreham, NY

We posed this question to Jerry White, who responded with the following self-documented Assembler Editor listing. Jerry suggests that, when printing characters to the screen in Assembly Language, that you stick to using documented ROM jump vectors such as the Central I/O routine Vector (CIOV at $E456) as described in De Re Atari, *rather than using the put character subroutine at $F6A4.*
—ANTIC ED

```
0100           .OPT NOEJECT
0110 ;MODE1.SRC BY JERRY W
     HITE
0120 ;
0130 ;THIS ASSEMBLER CODE S
     IMULATES
0140 ;THE FOLLOWING BASIC P
     ROGRAM:
0150 ;
0160 ;CLOSE #6
0170 ;GRAPHICS 1
0180 ;PRINT #6;"GRAPHICS M
     ODE ONE"
0190 ;PRINT "TEXT WINDOW"
0200 ;
0210 ;ASSEMBLE THEN
0220 ;EXECUTE FROM BUG (G6
     20)
0230 ;
0240 ;
0250           *=    $600       ;
     RELOCATABLE
0260 ;
0270 DEV   .BYTE "S:"      ;SC
     REEN
0280 MSG1  .BYTE "GRAPHICS
     MODE ONE",$9B
0290 MSG2  .BYTE "TEXT WIND
     OW",$9B
0300 ;
0310       LDX #$60        ; IOC
     B #6
0320       LDA #$C         ; CL
     OSE
0330       STA $342,X
0340       JSR $E456       ; LET
     CIOV DO IT
0350 ;
0360       LDX #$60        ; IOC
     B #6
0370 ;
0380       LDA #$3         ; OP
     EN
0390       STA $342,X
0400       LDA #DEV&$00FF; A
     DDRESS
0410       STA $344,X
0420       LDA #DEV/256    ;
     OF DATA
0430       STA $345,X
0440       LDA #$1C        ; R
     EAD/WRITE
0450       STA $34A,X
0460       LDA #$1         ; GR
     . 1
0470       STA $34B,X
0480       JSR $E456       ; LE
     T CIOV DO IT
0490 ;
0500       LDX #$60        ; IO
     CB #6
0510       LDA #$9         ;PU
     T RECORD
0520       STA $342,X
0530       LDA #MSG1&$00FF;
     ADDRESS
0540       STA $344,X
0550       LDA #MSG1/256 ;
     OF DATA
0560       STA $345,X
0570       LDA #$12        ; LE
     NGTH OF
0580       STA $348,X
0590       LDA #$0         ; M
     SG1
0600       STA $349,X
0610       JSR $E456       ; LE
     T CIOV DO IT
0620 ;
0630       LDX #$0         ; IO
     CB #0 (TEXT)
0640       LDA #$9         ; PU
     T RECORD
0650       STA $342,X
0660       LDA #MSG2&$00FF;
     ADDRESS
0670       STA $344,X
0680       LDA #MSG2/256 ;
     OF DATA
0690       STA $345,X
0700       LDA #$D         ; LE
     NGTH
0710       STA $348,X
0720       LDA #$0         ; M
     SG2
0730       STA $349,X
0740       JSR $E456       ; LE
     T CIOV DO IT
0750       BRK             ; EN
     D DEMO
```

OBJECTION

I object to your encouraging the use of such products as Micropainter, Paint, and Versawriter in your cover art contest. Those of us who do not own any of these do not have a fair chance to win.

Concerned
Programmer

One of the first entries to the contest was a very impressive full-color drawing done in Graphics Mode 7 in BASIC A+. The ATARI's inherent graphics capabilities are quite powerful and may be readily harnessed without special software. —ANTIC ED

TRANSLATION

Are Microsoft BASIC and Applesoft BASIC compatible? Could I use Apple programs in my ATARI? Why or why not?

David Moore
Ballston Lake, NY

You can't use Apple programs on your ATARI. Each machine has a distinctly different Operating System, and the ATARI has additional chips not present on the Apple. There are many similarities among the various forms of BASIC, and if you familiarize yourself with them, it is possible to "translate" BASIC programs from one machine into BASIC programs for another. The ATARI Microsoft BASIC manual includes a section on converting programs. —ANTIC ED

APX

On top of the heap

by ROBERT DEWITT

Once upon a time there was a wonderful machine that had almost nothing to do. It was the ATARI Home Computer. "We need more software!" cried all the new ATARI owners. "Okay, okay, we're working on it," Atari officials soothed them, and that's how APX was born.

APX stands for Atari Program Exchange, until recently a slightly known and casually regarded stepchild of the parent company. But in the last year APX has shown its muscle as a profit center and is at least as strong and hearty as any competing software company. It now offers over 170 titles for the ATARI computers, among them some of the best, and best values, available anywhere.

To top if off, all the APX products are the work of ATARI users, most of them amateurs. Anyone can submit their program, and if APX accepts it, the author receives a royalty while APX takes care of the dirty work — otherwise known as business details.

The royalty is 10% of the net amount received by APX for the product. If the program retails for $20, and the wholesaler pays $10, the author gets one dollar. If the program is sold directly to the user through mail order for $20, the author gets two dollars. Those interested in supporting fellow users, therefore, should order by mail. But it has been the growth of wholesale volume that has accelerated APX sales. Mail order once accounted for all APX business, but is now just a tenth of it, and has only grown slightly since 1981.

Fred Thorlin, Director of APX, still encourages submissions as vigorously as when he had only 31 titles to sell. The competition is tougher now, he admits, and many of the early programs wouldn't pass muster these days. He won't say what the percentage of rejects is, but it is much higher than when APX started.

APX offers a special incentive to software authors, the annual $25,000 Star Award for the best program of the year. The two winners so far have been Fernando Herrera for **My First Alphabet**, and David Buehler for **Typo Attack**. Besides that, APX products may be adopted by Atari and made into "mainline" Atari products. This happened to **Caverns of Mars**, by Greg Christensen, and APX authorship is still the main portal for programmers to be hired by Atari.

Thorlin's advice to would-be authors is: write your program about something you know and care about (don't try to figure out what will sell); be original (shoot-em-ups are much too common anymore); improve your program by testing it on your friends; and make sure the program works before you send it in. APX staff will evaluate your program, but won't improve it, even if it is accepted. Improvement is always the author's responsibility.

Products are offered in cassette or diskette form, both actually dubbed at the APX facility in Santa Clara, CA. Cassettes, especially, are given careful treatment, each directly recorded from an ATARI 800 rather than from an intermediate audio master. This has made APX tapes the most reliable in the Atari market. Cassette orders used to dominate at APX, but have recently been surpassed by diskettes. So far, APX produces no cartridge software.

The best-selling APX program is **Eastern Front**, by Chris Crawford, a mainline ATARI programmer. The hot APX newcomer is Mark Reid's **Getaway!**, for which a handsome poster-map has been produced. The current in-house

continued on next page

APX *continued from page 11*
favorite is **Galahad**, a graphics adventure by Doug Crockford, for which you have to make your own map.

Fred Thorlin, now Director of APX, has guided it since its inception in February 1981, when he was Manager of ASAP, the Atari Software Acquisition Program. His subordinate at the time, Dale Yocum, began the APX effort with a collection of utility routines intended to help programmers create better programs. Soon APX was getting material that could stand on its own, and now even APX can do that. As the most profitable unit of the Home Computer Division of ATARI, APX now functions as a company within the company, with Fred as the boss.

An easygoing man, a statistician by training and a former software manager for Texas Instruments, Fred Thorlin seems to enjoy the spacious new quarters and friendly crew at APX. He delights in his products, and is quick to grab a joystick or boot up a game. He is proud that Atari has established this way of letting its customers participate in the glory and gelt of software publishing: "The only company that does," he asserts.

The APX titles are all described in the catalog that APX sends periodically to all ATARI owners who have submitted warranty cards. Catalogs are available from APX by calling 800-538-1862 (in California dial 800-672-1850).

Don't forget to

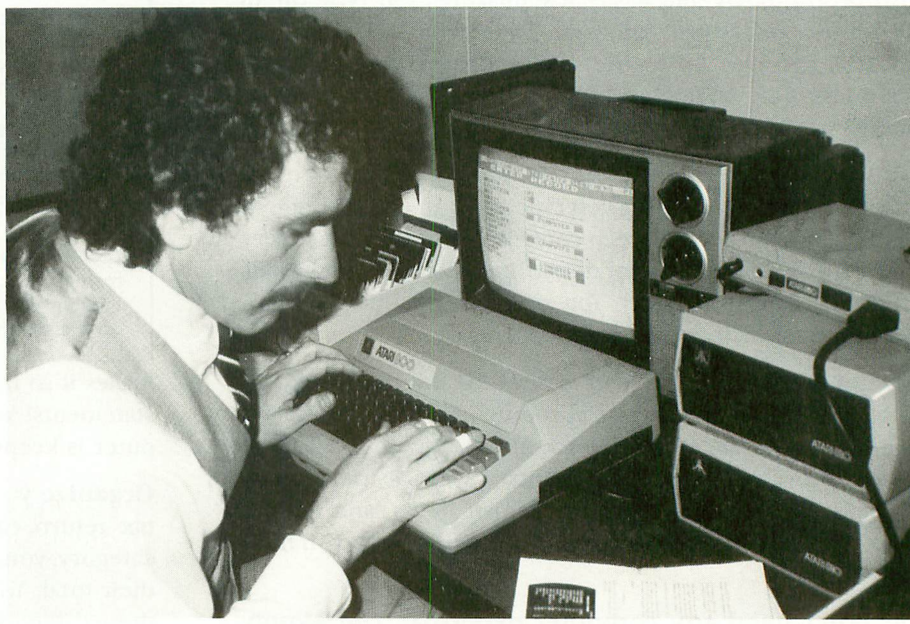
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Filling the GAP

Atari systems support clothing stores

by BRIAN LEE



While the ATARI personal computers have not garnered much recognition as a bonafide business tool, there are those of us who still believe that it offers efficient and cost effective solutions in the business environment. The Gap Stores, Inc., national retailer of casual clothing, is one example of an organization using ATARIs for business applications. Their use of microcomputers, including the ATARI 800, has contributed to overall profitability and productivity of the entire company.

WHY ATARI?

When I worked at The Gap as Manager of Budget and Expense Control, I was responsible for the expense control programs of the Store Operations division, encompassing 500 plus stores and related overhead cost centers. Since most of the expense tracking and budgeting was being done manually at the time, I sought to automate the process as much as possible. Since I owned an ATARI 800, I began transporting my computer back and forth to work every day. As the benefits offered by the computer became evident, The Gap boldly implemented a network of ATARIs which now total nearly two dozen systems.

Each work station consists of a 48K ATARI 800, at least one ATARI 810 disk drive, an ATARI 850 interface module, a Hitachi color television, and an Epson MX-100 printer. Three major software packages are provided for each station: The Atari Word Processor, VisiCalc and FileManager+. Each of the nine regional offices received one complete system and the rest were installed at the corporate offices in San Bruno, California.

APPLICATIONS

Weekly sales figures, cash register overages and shortages, and new store opening schedules are all tabulated using VisiCalc. The "what if" features of VisiCalc permit managers to see the effect of varying expense structures, product mixes, and sales promotions on profit margins.

The word processor provides a nice alternative to the typewriter and decreases the time required to edit weekly sales reports and interoffice correspondence.

FileManager 800+ is used by each regional office to maintain personnel files for all management positions as well as tracking of invoices and incidences of theft.

In addition, special application programs were written to aid in the budgeting and monitoring of expenses. One such program permitted the consolidation of several VisiCalc matrices into a summary report.

Another program generated bar graphs, pie charts, line graphs, and scatter plots from the data entered in the VisiCalc matrices. The graphs produced by this program were then used for slide presentations to management. With the sales information in the computer, trends were easily determined using the graphs and special forecasting programs which I wrote. These programs form the basis of a program called Trend Manager due to be released through Synapse Software.

A LOOK TO THE FUTURE

Among the projects planned are a communications link between the regional offices and headquarters to replace the Qwip machines currently being used. ATARI 400's will be used with custom designed hardware to monitor and analyze customer traffic patterns in an effort to match scheduling to customer flow.

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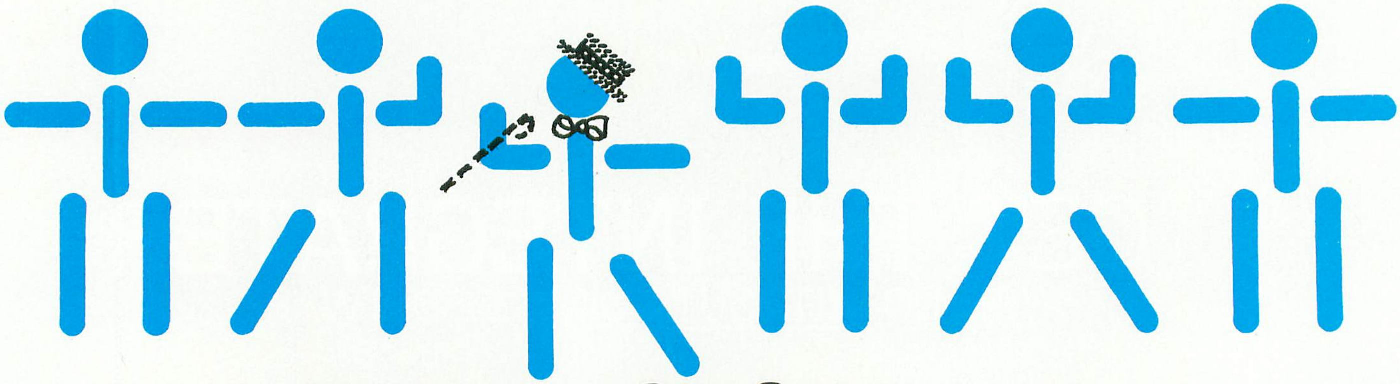
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Dancin' Man

by STEVE ENGLEHART and DAVE MENCONI

You certainly don't need to know anything about computer science to play games on your ATARI, nor to use the many programs already in existence — but eventually you'll want to begin programming your computer. Perhaps there's a special application you need (a pigeon-feeding scheduler, for example), or you have an idea for a great video game.

To make these things happen you'll need to know how to write your own programs. Programs are step-by-step instructions for the computer to follow. And if you're going to write a program, you need a *language* to write it in. By far the most common language — and probably the easiest — is BASIC (Beginners All-purpose Symbolic Instruction Code). ATARI BASIC comes ready-to-use inside its own cartridge, which you insert in the computer before you begin your programming.

This article will show you a short BASIC program that exercises some of the graphics power of the ATARI, so even if you've used BASIC on other machines you'll still benefit from this example.

SIMPLE ANIMATION

The easiest way to learn anything is to play with it and have fun. We'll start with something simple: making a little stick figure dance around on the screen. The animation is admittedly crude, but we can work on *improving* it after we *understand* it.

BASIC programs are written in *statements*. You can have more than one statement on a line, but each line is given a number so the computer knows the order to process them, and can easily refer to the program's parts.

To make this little man dance, we have to define four parts of the figure's body; the head, the shoulders, the body and the legs. In BASIC we call each of these definitions a *string variable*, and name them like this: HEAD$, SHLDR$, BODY$, and LEG$. (We could spell out SHOULDER if we wanted to, but abbreviation saves typing.) The "$" is always used at the end of the word to indicate that it is a string variable.

One thing that's not immediately evident on your computer is that the "letter" keys can also be used to put *graphics characters* on your screen, when the [CLTRL] (control) key is held down. These characters, and the keys which control them, are shown on the back cover of the BASIC Reference Manual. See our character table (page 18, this issue) for guidance on typing these characters.

Each of the four body parts is constructed from three graphics characters. The head and body have only one possible shape while the legs and shoulders have four and six different shapes respectively. To make the figure appear to move we draw the head, a randomly selected shoulder, the body, and a randomly selected set of legs — then clear the screen and draw the figure again at a different place.

Be very careful about spaces inside the quotes when you type this program. Everything else is typed just as you see it.

A detailed explanation of the program follows.

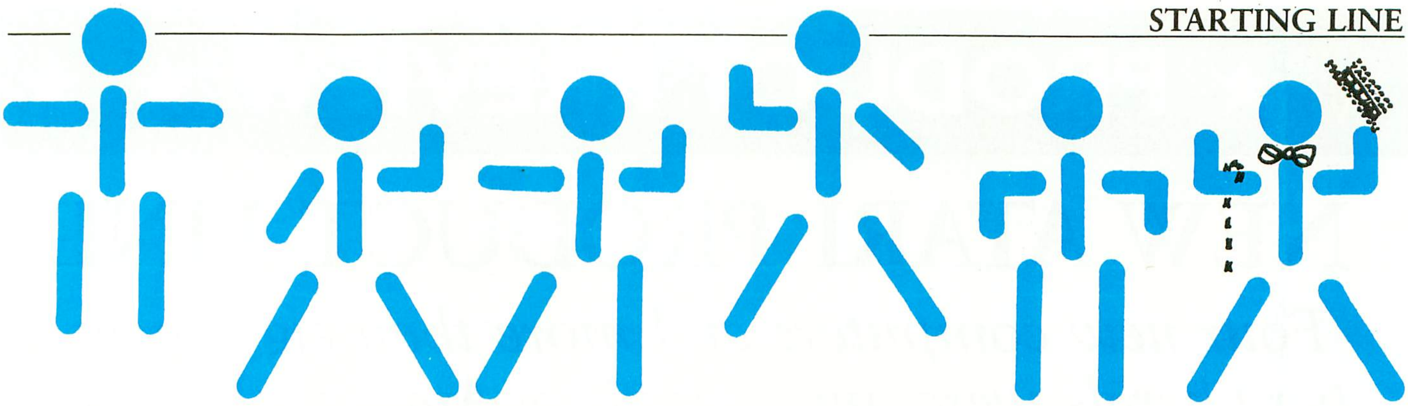
10: The REM statement is not processed by BASIC. It is used to put REMARKS in the program that explain how the program works, record the name of the program (as here) or whatever else the programmer wants.

Programmers often number their lines by tens or twenties, so that they can insert lines later, if necessary.

20: A DIM statement tells BASIC to reserve space (a dimension) for the string variables. We measure space in keystrokes — that is, we use three keystrokes to make a head, eighteen to make six different kinds of shoulders, and so on. If we reserve more space than we need, that's fine. If we don't reserve enough, the computer will give us an error message.

40: The GRAPHICS statement selects the way that the picture on your screen is presented. The number that we put after GRAPHICS determines the *mode* of the picture.

60: This statement makes the cursor invisible. The POKE statement allows us to put (to POKE) a number into a particular memory address. Some addresses are located in the computer's built-in Operating System; they have pre-set numbers which give the computer pre-set orders, but you can change the orders with a POKE. The first number after the POKE is the address (in this case, 752) while the second number is the number we want to put there (1).



80–140: These lines define the possible positions of our dancing man. He has only one head but there are six possible shoulders and four possible legs. Note that each part of the body — the head, the shoulders, the body, and the legs — is three characters long. This insures that our figure's various pieces will line up properly.

160: The numeric variable P determines how far from the left we will draw the figure. By changing P we will make the figure appear to move back and forth.

180: RND(0) is a standard BASIC command. It tells the computer to pick a random number between zero and one. We call that random number R. Then we add one to P if R is less than .5, or subtract one from P if R is greater than .5. In the unlikely event that R is equal to .5, we leave P alone. As P increases and decreases, the figure moves one space to the right or left.

200: Here we select one of the six shoulder combinations from the string in line 100. The first shoulder group begins with the first character and ends with the third. The second group begins with the fourth character, the third with the seventh character, etc. Therefore, we need to randomly select among the numbers 1, 4, 7, 10, 13 or 16 as a starting point for the shoulder group. To do this, we generate a random number between zero and one, and multiply it by six. This gives us a decimal fraction between zero and six. Then we use another standard command, INT, which takes the *integer* part of that number. This gives us a random whole number between zero and five (do you see why it can't be six?). We multiply this whole number by three, giving 0, 3, 6, 9, 12 or 15, and add one to get the desired number. This whole process sets S randomly to equal 1, 4, 7, 10, 13, or 16. That number is then used to select which of six shoulder shapes to use.

220: In this line L is generated the same way S was, to select one of the four leg shapes (1, 4, 7, or 10).

240: This is another standard command which clears the screen. We ask the computer to PRINT this string so that any figure already drawn will be erased before we draw another one. If you removed this line you would see pieces of the figure slowly scatter across the screen.

250: Lines 250 & 255 check to see if the image's position is exceeding the screen bounds. If this is the case, the image is repositioned at the opposite edge to create "wrap-around" effect.

260: Lines 260, 300, 340, and 380 position the (invisible) cursor for the head, shoulders, body and legs, respectively. P is the always-changing horizontal position, as determined in line 180, while the vertical position is simply increased by one in each of these four lines. Since P only changes by one each time as well, all four parts move together.

280: Lines 280, 320, and 400 cause the head, shoulders, body and legs to be put on the screen where they belong. In the case of the shoulders, the actual shape to be used is part of the SHLDR$ beginning with that random value of S and ending with S + 2 (the end of a three-character set: S, S + 1, S + 2). LEG$ works the same way.

420: This causes another figure to be drawn. All the steps between this line 180 and 420 will be executed over and over until you stop it by pressing the BREAK key.

This seems like a lot of things to take in at once, doesn't it? But the longer you use this program, and watch your little man dance, the more natural these concepts will become — and the sooner you'll be able to use all of your computer.

```
20 DIM HEAD$(3),SHLDR$(18),BODY$(3),LEG
   $(12)
40 GRAPHICS 0
60 POKE 752,1
80 HEAD$=" ◘ "
100 SHLDR$="◥┼┐┗┼┐┏┼┛┗┼┛━┼┐┏┼━"
120 BODY$=" | "
140 LEG$="▌ ▐▌◢ ▐▌ ▐◣◢ ◣"
160 P=20
180 R=RND(0):P=P+(R<0.5)-(R>0.5)
200 S=3*INT(RND(0)*6)+1
220 L=3*INT(RND(0)*4)+1
240 ? CHR$(125)
250 IF P=40 THEN P=2
255 IF P<2 THEN P=39
260 POSITION P,15
280 ? HEAD$
300 POSITION P,16
320 ? SHLDR$(S,S+2)
340 POSITION P,17
360 ? BODY$
380 POSITION P,18
400 ? LEG$(L,L+2)
420 GOTO 180
```

WORKS WITH 1200XL

★ ★ PRODUCT PREVIEW ★ ★

NEW ATARI PRODUCT LINE

Four new computers and more than eight new peripherals were announced by Atari at the June Consumer Electronics Show in Chicago.



NEW COMPUTERS:

Atari's top-of-the-line home computer is now the new 1450XLD. Selling for less than $1000, this new computer boasts a built-in double-sided double-density disk drive, a built-in modem, and a built-in voice synthesizer. The disk drive will operate two to three times faster than current models because it directly accesses the processor buss. An extra bay for a second drive is designed into the computer. Atari surprised the home computer industry by announcing this powerful machine at such a low price.

To complement this new Atari line are the new 1400XL, 800XL, and 600XL computers. The 600XL is aimed at the "low end" of the market. It will sell for less than $200 with 16K built-in memory, expandable to 64K. The 1400XL is essentially the same as the 1450XLD, but lacks a built-in disk drive.

Exceptional features are:

★ Contemporary high-tech styling.
★ Built-in ATARI BASIC (Rev. B).
★ Voice-synthesizer (1400/1450 Models only).
★ Connection of peripherals without special hardware.
★ Access to data buss for easy connection to third-party hardware such as expanded memory, music synthesizers, and 80-column cards.

Of special significance are three new expansion units:

- A CP/M expansion unit opens the world of CP/M business and data management programs in either 40-or 80-column format (existing programs only require reformatting.).
- An Expander Box available for the new computers provides eight special plug-in slots plus two RS-232 ports and a bi-directional parallel buss to accommodate third-party software and peripherals.
- The ATARI 600XL, delivered with 16K, can be expanded to 64K with a new Memory Module.

PERIPHERALS:

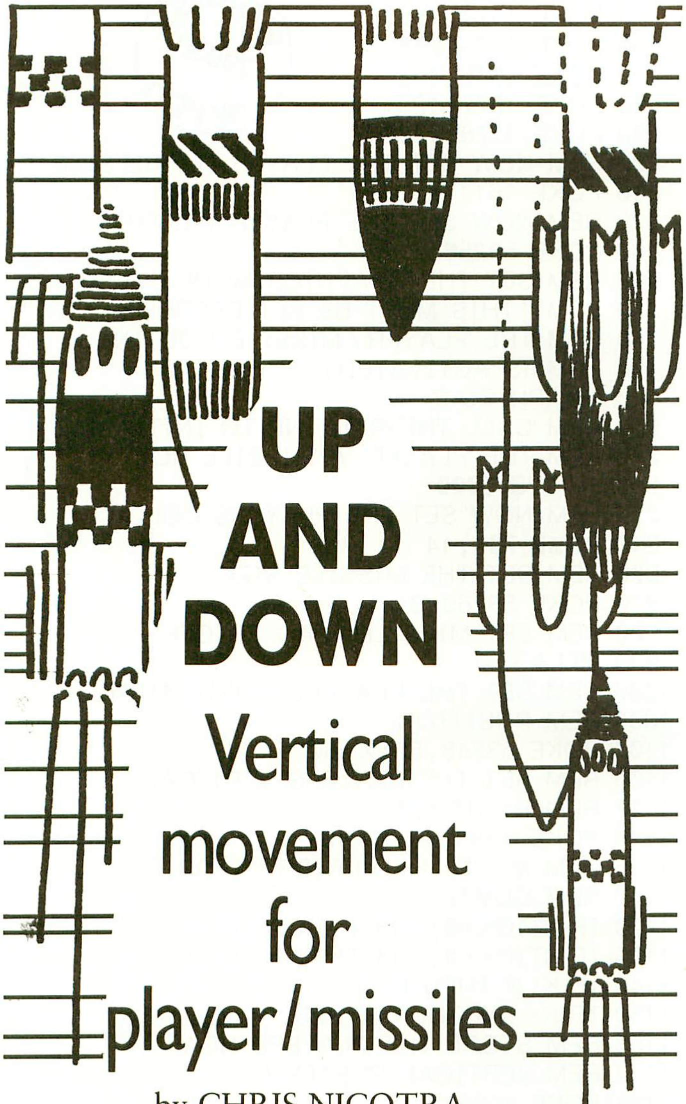
Compatible computer peripherals announced at the show are headed by the new ATARI 1027 letter-quality printer which requires no interface and will retail for less than $400. It is bi-directional at 20 characters per second.

The ATARI 1025 80-column printer and the ATARI 40-column color plotter/printer were also shown.

The 1050 Disk Drive in single-density format will be released soon with DOS 2.0S for less than $500. DOS 3.0 will be available in September, and provides double-density capability.

In the telecommunications area, the new ATARI 1030 direct-connect modem will auto-dial from the computer keyboard, answer automatically, will dial pulse or tone, and switch the printer on and off. It is fully compatible with TeleLink I and TeleLink II.

Rounding out the line are new joysticks (wired and remote control), TRAK-BALL, light pen, and a graphics touch tablet.



UP AND DOWN

Vertical movement for player/missiles

by CHRIS NICOTRA

Player/Missile graphics are among the most powerful capabilities of the ATARI computer. Using the computer's horizontal-position register, simple players can be quickly moved across the screen. This means you can write impressive, arcade-style games even in BASIC.

Many articles describe how the amateur programmer can use this tool. Most of these also mention the problem of slow vertical motion. Since the only way to move the player up or down from BASIC is to shift the player image using PEEKs and POKEs, the vertical motion of a player is considerably slower than the horizontal motion.

One solution is an Assembly Language routine to shift the player tables vertically one position at a time. Unfortunately, this does not come close to equalling the horizontal-motion capabilities of Player/Missile graphics. This article gives you a simple Assembly Language routine that will make vertical motion as simple and fast as horizontal motion, and shows you how to use it from BASIC.

You will need to know the fundamentals of P/M graphics from other sources to benefit from this article. Since the purpose here is to show you a tool for game writing, I will touch only briefly on the meaning of the P/M registers.

WHAT THIS ROUTINE DOES

Once the Player/Missile routine is installed, it becomes part of the vertical-blank service routine. Then, every 60th of a second, the computer will erase each of the players and missiles from the screen and re-draw them in their new vertical position. This entire process is transparent to you, the programmer. Your only task is changing the vertical- and horizontal-position registers; and the players and missiles will move around the screen.

HOW TO USE IT

First, load the Player/Missile routine into memory. This is done by calling the "load" subroutine, beginning at line 8000, as follows:

```
GOSUB 8000
```

Second, define each player's image. To do this, POKE the desired image into the player-image table. The following table shows the address to store each player's image:

PLAYER	LOCATION
0	1571–1580
1	1581–1590
2	1591–1600
3	1601–1610

These images are laid out in memory the same way the players are in the Player/Missile table. For example, if you want player zero to look like this:

```
*      *  =  129  decimal
*      *  =  129  decimal
*  **  *  =  153  decimal
********  =  255  decimal
********  =  255  decimal
*  **  *  =  153  decimal
*      *  =  129  decimal
*      *  =  129  decimal
```

you could use the following code to set-up the image:

```
POKE 1571,129
POKE 1572,129
POKE 1573,153
POKE 1574,255
POKE 1575,255
POKE 1576,153
POKE 1577,129
POKE 1578,129
```

Next, POKE this size of the player image into the player-size table. The following is a table of player-size locations:

PLAYER	LOCATION
0	1611
1	1612
2	1613
3	1614

Since the player used in our example contained eight bytes

continued on next page

in the image table, POKE 7 (one less than the number of bytes) into the player-size table for player number zero.

POKE 1611,7

Next, select the Graphics Mode to be used in the program. Finally, activate the Player / Missile routine by calling the Player / Missile initialization routine, beginning at Line 9000, as follows:

GOSUB 9000

At this point, the system has a set of vertical-position registers. The location of these registers is shown in this table:

VERTICAL POSITION REGISTER

PLAYER	LOCATION
0	1536
1	1537
2	1538
3	1539
MISSILES	**LOCATION**
0	1540
1	1541
2	1542
3	1543

SWITCH THE P / M ROUTINE OFF

Whenever the Graphics Mode in BASIC changes, so does the size of the display buffer. As a result, the pointers to the player and missile tables must be changed. Unfortunately, while the pointers are being changed, the Player / Missile routine is trying to use them. In other words, the Player / Missile routine could grab a half-changed address from the pointer table and start putting the player's image in the wrong part of memory. This could be disastrous. The Player / Missile routine should be turned *off* to prevent this conflict by POKEing a 1 into location 1562. The Graphics Mode can then be changed and the Player / Missile routine can be re-initialized by the initialization routine. The following instructions might be used to safely change the Graphics Mode in a program:

POKE 1562,1
GRAPHICS 3
GOSUB 9000

Listing 1 demonstrates these routines. In this program, the joystick moves the player, and a missile is shot by pressing the trigger on the joystick.

Listing 2 contains the Assembly Language listing of the Player / Missile routine.

Program 1

```
1 REM LOAD THE PLAYER / MISSILE ROUTINE
2 GOSUB 8000
10 REM SET UP PLAYER ONE IMAGE
20 POKE 1571,129
30 POKE 1572,129
40 POKE 1573,153
50 POKE 1574,255
60 POKE 1575,255
70 POKE 1576,153
80 POKE 1577,129
90 POKE 1578,129
100 REM NOW SET THE PLAYER IMAGE SIZE
110 POKE 1611,7
120 REM NOW SET THE PLAYER WIDTH
130 POKE 53256,1
140 REM SET THE GRAPHICS MODE
150 REM (THIS MUST BE SET BEFORE
160 REM THE PLAYER/MISSILE ROUTINE
170 REM IS ACTIVATED)
180 GRAPHICS 2
200 REM CALL THE ROUTINE TO INITIALIZE
210 REM THE PLAYER / MISSILE ROUTINE
220 GOSUB 9000
230 REM NOW SET THE PLAYERS COLOR
240 POKE 704,14
900 REM SET THE MISSILE SIZE
910 POKE 53260,3
920 REM SET MISSILE FLAG TO OFF
930 MFLAG=0
1000 REM SET THE PLAYERS HORIZONTAL
1005 REM POSITION
1100 POKE 53248,50:X=50
1105 REM SET THE PLAYERS VERTICAL
1107 REM POSITION
1110 POKE 1536,40:K=40
1115 REM MOVE THE PLAYER UP OR
1117 REM DOWN
1120 IF STICK(0)=13 THEN K=K+2
1130 IF STICK(0)=14 THEN K=K-2
1140 IF K=0 THEN K=2
1150 IF K=128 THEN K=126
1153 REM STORE THE PLAYERS NEW
1154 REM VERTICAL POSITION
1155 POKE 1536,K
1156 REM MOVE THE PLAYER LEFT OR
1157 REM RIGHT
1160 IF STICK(0)=7 THEN X=X+2
1170 IF STICK(0)=11 THEN X=X-2
1180 IF X>190 THEN X=190
1190 IF X<40 THEN X=40
1194 REM STORE THE PLAYERS NEW
1196 REM HORIZONTAL POSITION
1200 POKE 53248,X
1205 REM IF A MISSILE IS ON THE
1207 REM SCREEN THEN JUMP TO THE
1208 REM MISSILE MOVE CODE
1210 IF MFLAG=1 THEN GOTO 2000
1215 REM IF THE TRIGGER IS NOT BEING
1216 REM PUSHED THEN JUMP BACK UP
1217 REM TO THE PLAYER MOVE CODE
1220 IF STRIG(0)<>0 THEN GOTO 1120
1223 REM IF THE PLAYER IS LOWER THEN
1224 REM POSITION 120 THEN IGNORE THE
1225 REM TRIGGER
1230 IF K>120 THEN 1120
1232 REM A MISSILE HAS BEEN FIRED
1234 REM SET THE MISSILES VERTICAL
1236 REM POSITION AND ...
1240 MY=K+2
1245 POKE 1540,MY
```

```
1247 REM SET THE MISSILE FLAG AND...
1250 MFLAG=1
1252 REM ...AND SET THE MISSILES
1254 REM HORIZONTAL POSITION AND...
1260 POKE 53252,X+6
1272 REM ...THEN JUMP BACK TO THE
1275 REM PLAYER MOVE CODE
1280 GOTO 1120
2000 REM THIS IS THE MISSILE MOVE
2001 REM CODE
2002 REM INCREMENT THE MISSILES
2003 REM VERTICAL POSITION
2005 MY=MY+4
2006 REM IF THE MISSILE WOULD BE OFF
2007 REM THE SCREEN TURN IT OFF
2010 IF MY>128 THEN POKE 53252,0:MFLAG=0:
    POKE 1540,0:GOTO 1120
2015 REM SAVE THE NEW MISSILE
2016 REM LOCATION
2020 POKE 1540,MY
2025 REM JUMP BACK TO THE PLAYER
2026 REM MOVE CODE
2030 GOTO 1120
8000 REM ROUTINE TO LOAD THE P/M
8010 REM HANDLER
8020 FOR I=0 TO 234
8030 READ J
8040 POKE 1536+I,J
8050 NEXT I
8060 RETURN
8100 DATA 0,0,0,0,0
8110 DATA 0,0,0,0,0
8120 DATA 0,0,0,0,0
8130 DATA 0,0,0,0,0
8140 DATA 0,0,0,0,0
8150 DATA 0,0,35,6,45
8160 DATA 6,55,6,65,6
8170 DATA 0,0,0,0,0
8180 DATA 0,0,0,0,0
8190 DATA 0,0,0,0,0
8200 DATA 0,0,0,0,0
8210 DATA 0,0,0,0,0
8220 DATA 0,0,0,0,0
8230 DATA 0,0,0,0,0
8240 DATA 0,0,0,0,0
8250 DATA 0,0,0,0,104
8260 DATA 162,6,160,90,169
8270 DATA 7,32,92,228,96
8280 DATA 173,26,6,208,6
8290 DATA 32,187,6,32,104
8300 DATA 6,76,98,228,169
8310 DATA 3,133,203,166,203
8320 DATA 189,0,6,133,205
8330 DATA 188,8,6,157,8
8340 DATA 6,189,75,6,133
8350 DATA 204,138,10,170,189
8360 DATA 16,6,133,206,189
8370 DATA 17,6,133,207,189
8380 DATA 27,6,133,208,189
8390 DATA 28,6,133,209,166
8400 DATA 204,169,0,145,206
8410 DATA 136,192,255,240,3
8420 DATA 202,16,246,164,204
8430 DATA 177,208,164,205,145
8440 DATA 206,136,132,205,192
8450 DATA 255,240,4,198,204
8460 DATA 16,237,198,203,16
8470 DATA 178,96,162,3,173
8480 DATA 24,6,133,206,173
8490 DATA 25,6,133,207,188
8500 DATA 12,6,189,231,6
8510 DATA 49,206,145,206,188
8520 DATA 4,6,189,227,6
8530 DATA 17,206,145,206,152
8540 DATA 157,12,6,202,16
8550 DATA 229,96,2,12,32
8560 DATA 192,252,242,207,47
8700 RETURN
9000 REM P/M INITIALIZATION
     ROUTINE
9005 REM INITIALIZE THE PMBASE
9006 REM REGISTER
9020 I=PEEK(106)-8
9030 POKE 54279,I
9035 REM INDICATE DOUBLE LINE
9036 REM RESOLUTION
9040 POKE 559,46
9045 REM TURN ON BOTH THE PLAYERS
9046 REM AND THE MISSILES
9050 POKE 53277,3
9060 REM SETUP A TABLE OF PLAYER
9070 REM AND MISSILE ADDRESS
9100 PMBASE=I*256
9110 MISSILE=PMBASE+384
9120 J=INT(MISSILE/256)
9130 POKE 1560,(MISSILE-J*256)
9140 POKE 1561,J
9150 PLAYER0=PMBASE+512
9160 J=INT(PLAYER0/256)
9170 POKE 1552,(PLAYER0-J*256)
9180 POKE 1553,J
9190 PLAYER1=PMBASE+640
9200 J=INT(PLAYER1/256)
9210 POKE 1554,(PLAYER1-J*256)
9220 POKE 1555,J
9230 PLAYER2=PMBASE+768
9240 J=INT(PLAYER2/256)
9250 POKE 1556,(PLAYER2-J*256)
9260 POKE 1557,J
9270 PLAYER3=PMBASE+896
9280 J=INT(PLAYER3/256)
9290 POKE 1558,(PLAYER3-J*256)
9300 POKE 1559,J
9400 REM
9410 REM NOW CLEAR THE PLAYER / MISSILE A
     REA
9420 FOR J=PMBASE TO PMBASE+1024
9430 POKE J,0
9440 NEXT J
9450 REM
9480 REM
9580 REM START VERTICAL ROUTINE
9590 A=USR(1615)
9600 RETURN
```

continued on next page

TYPO TABLE

Variable checksum = 368582

Line num	range	Code	Length
1	- 100	KZ	284
110	- 230	ZL	307
240	- 1115	NX	295
1117	- 1170	KN	321
1180	- 1217	SY	318
1220	- 1250	VP	300
1252	- 2006	CK	290
2007	- 8030	CL	285
8040	- 8180	JQ	169
8190	- 8300	FX	211
8310	- 8420	KJ	265
8430	- 8540	DU	270
8550	- 9045	ZY	257
9046	- 9170	HD	257
9180	- 9290	YH	237
9300	- 9600	QM	167

Program 2

```
;SET VERTICAL BLANK VECTOR
SETVBV   EQU     $E45C
;VERTICAL BLANK EXIT VECTOR
XITVBV   EQU     $E462
;
;    ------------------------------
;    ZERO PAGE REGISTERS VARIABLES
;    ------------------------------
;
         ORG     $CB
VAR1     DB      0
VAR2     DB      0
VAR3     DB      0
ADD1     DS      2
ADD2     DS      2
;
;
;
;    ------------------------------
;    PROGRAM STORAGE LOCATIONS
;    ------------------------------
;
         ORG     $600
PVERT     DB      0,0,0,0
MVERT     DB      0,0,0,0
POLDVERT DB      0,0,0,0
MOLDVERT DB      0,0,0,0
;
;
;PLAYER TABLE ADDRESS TABLE
PLAYER
         DB      0,0
         DB      0,0
         DB      0,0
         DB      0,0
;
;MISSILE TABLE ADDRESS TABLE
MISSILE
         DB      0,0
;
;ON/OFF SWITCH
SWITCH  DB      0
;
;PLAYER IMAGE ADDRESS TABLE
IMAGE
         DW      IMAGE0
         DW      IMAGE1
         DW      IMAGE2
         DW      IMAGE3
;
;IMAGE DEFINITION TABLE
;
; IMAGES
IMAGE0    DB      0,0,0,0,0
          DB     0,0,0,0,0
IMAGE1    DB      0,0,0,0,0
          DB     0,0,0,0,0
IMAGE2    DB      0,0,0,0,0
          DB     0,0,0,0,0
IMAGE3    DB      0,0,0,0,0
          DB     0,0,0,0,0
;
;PLAYER SIZE TABLE
PSIZE   DB      0,0,0,0
;    ------------------------------
;    INITIALIZE THE PM ROUTINE
;    ------------------------------
;
;
; THIS IS THE BASIC ENTRY POINT
         PLA
;
; SETUP THE VERTICAL BLANK INTERUPT
; JUMP VECTOR
         LDX     #HIGH VB
         LDY     #LOW VB
         LDA     #7
         JSR     SETVBV
         RTS
;
;
;    ------------------------------
;    VERTICAL BLANK ROUTINE   (PM)
;    ------------------------------
;
;
VB
         LDA     SWITCH  ;CHECK IF THE SWITC
         H IS ON
         BNE     VB1     ;IF NOT THEN JUST RET
         URN
         JSR     MPLOT   ;CALL THE MISSILE PL
         OT ROUTINE
         JSR     PPLOT   ;CALL THE PLAYER PLO
         T ROUTINE
VB1      JMP     XITVBV
;
;
; THIS IS THE ROUTINE TO PLOT THE
; PLAYERS
PPLOT:
         LDA     #3          ;SET THE PLAYER
         COUNT
         STA     VAR1        ; AND SAVE IT IN
         VAR1
PPLOT0:
         LDX     VAR1        ;GET THE CURRENT
         PLAYER NUMBER
         LDA     PVERT,X     ;GET THE NEW Y
```

```
        COOR
        STA     VAR3         ; AND SAVE IT IN
        VAR3
        LDY     POLDVERT,X   ;GET THE OLD Y
        COOR
        STA     POLDVERT,X   ;STORE THE NEW
        Y COOR AS THE OLD
        LDA     PSIZE,X      ;GET THE SIZE OF
        THE CURRENT PLAYER
        STA     VAR2         ; AND STORE IT I
        N VAR2
        TXA                  ;MULTIPLY THE PLA
        YER NUMBER
        ASL     A            ; BY 2
        TAX
        LDA     PLAYER,X     ;MOVE THE ADDRE
        SS OF THE PLAYER
        STA     ADD1         ; TO THE TEMPOR
        ARY REGISTER (ADD1)
        LDA     PLAYER+1,X
        STA     ADD1+1
        LDA     IMAGE,X      ;MOVE THE ADDR
        ESS OF THE IMAGE
        STA     ADD2         ; TO THE TEMPORA
        RY REGISTER (ADD2)
        LDA     IMAGE+1,X
        STA     ADD2+1
; THIS SECTION OF CODE IS USED
;TO ERASE THE PLAYER FROM HIS
;OLD POSITION
        LDX     VAR2         ;LOAD X WITH THE
        SIZE OF THE PLAYER
        LDA     #0
PPLOT1
        STA     (ADD1),Y     ;STORE ZERO
        DEY                  ;DECREMENT THE BY
        TE POSITION COUNTER
        CPY     #$FF
        BEQ     PPLOT2       ;IF EQUAL WE'VE
        HIT THE TOP OF THE PLAYER
        DEX                  ;DECREMENT THE SI
        ZE COUNTER
        BPL     PPLOT1       ;IF STILL POSITIV
        E ZERO THE NEXT BYTE
;
;THIS PART OF THE CODE IS USED TO
;PLOT THE PLAYER 'N HIS NEW LOCATION
PPLOT2
        LDY     VAR2         ;GET THE IMAGE OFF
        SET
        LDA     (ADD2),Y     ;GET THE NEXT IM
        AGE BYTE
        LDY     VAR3         ;GET THE PLAYER TA
        BLE OFFSET
        STA     (ADD1),Y     ;PUT THE IMAGE
        BYTE IN THE PLAYER TABLE
        DEY                  ;DECREMENT THE PL
        AYER TABLE OFFSET
        STY     VAR3         ;STORE THE NEW PL
        AYER TABLE OFFSET
        CPY     #$FF         ;IF THE NEXT BYTE
        WOULD BE OFF THE END
                             ;OF THE PLAYER THEN
        EXIT THE PLOT LOOP
        BEQ     PPLOT3
        DEC     VAR2         ;DECREMENT THE IM
        AGE OFFSET
        BPL     PPLOT2       ;IF WE HAVE NOT R
        EACHED THE END THEN
                             ;LOOP AGAIN TO PLO
        T ANOTHER IMAGE BYTE
PPLOT3
        DEC     VAR1         ;DECREMENT THE PL
        AYER COUNT
        BPL     PPLOT0       ;IF THERE IS STILL
        ANOTHER PLAYER THEN
                             ;LOOP AGAIN TO PLO
        T THE NEXT PLAYER
        RTS
;
;
MPLOT
        LDX     #3           ;LOAD X WITH THE
        MISSILE COUNT
        LDA     MISSILE      ;PLACE THE ADDRE
        SS OF THE MISSILE TABLE
                             ;IN THE TEMPORARY
        ADDRESS REGISTER
        STA     ADD1
        LDA     MISSILE+1
        STA     ADD1+1
MPLOT0
        LDY     MOLDVERT,X ;GET THE OLD MI
        SSILE LOCATION
        LDA     OFFTABLE,X ;TURN THE OLD I
        MAGE OFF
        AND     (ADD1),Y
        STA     (ADD1),Y
        LDY     MVERT,X      ;GET THE NEW MI
        SSILE LOCATION
        LDA     ONTABLE,X    ;TURN THE NEW
        MISSILE IMAGE ON
        ORA     (ADD1),Y
        STA     (ADD1),Y
        TYA                  ;MOVE THE NEW LOC
        ATION TO THE OLD
                             ;MISSILE LOCATION
        TABLE FOR NEXT TIME
        STA     MOLDVERT,X
        DEX                  ;DECREMENT THE MI
        SSILE COUNTER
        BPL     MPLOT0       ;IF THERE IS STIL
        L ANOTHER MISSILE
                             ;THEN LOOP TO PLOT
        THE NEXT MISSILE
        RTS
;
ONTABLE DB      $02,$0C,$20,$C0
OFFTABLE DB     $FC,$F2,$CF,$2F
;
;
;      --------------------------------
;      DUMMY ROUTINE        (IGNORE)
;      --------------------------------
;
START
        JMP     ($0A)
        END     START
```

START

interrupting

by MARIAN LORENZ and ALLAN MOOSE

The Display List Interrupt (DLI) is a capability built into the ATARI that will help you create some of the spectacular graphics effects for which it is famous. DLIs are machine language subroutines that can be called from BASIC. Learning to use DLIs also serves as a gentle introduction to Assembly Language programming. This article describes DLI routines that put more color onto the screen.

In order to understand what a DLI does, it is necessary to know how the ATARI handles screen displays. Unlike other microcomputers, the ATARI uses several microprocessors. One is the Central Processor Unit (CPU), the 6502, which is primarily responsible for implementing programs and performing computations. Another is ANTIC, the microprocessor that controls the screen display. The program for ANTIC is called a Display List. A Display List is either invoked by a BASIC Graphics command or can be defined by the programmer. The Display List tells ANTIC where screen data is located, which display model to use, and whether special display options are to be implemented.

A Display List Interrupt is exactly what the name implies — an interrupt instruction put into a Display List. It is an instruction to ANTIC to interrupt the CPU's normal program. Once stopped by ANTIC, the CPU will carry out your DLI service routine and then return to its normal business. This option is available in any of the ANTIC character, graphic or blank mode lines and may be used along with Player/Missile graphics, character sets or color. With a DLI you can make changes in the screen image at precisely timed intervals.

To understand this article better, type in Program 1 and run it. We used a DLI to change the background color in Graphics 0 from blue to yellow, half-way down the screen. This simple example illustrates one application of the DLI — using the sequential nature of the TV image. You can divide the screen into sections, each with its own set of colors, and thereby increase the number of available colors in each Graphics Mode.

Program 1

```
 5 ? CHR$(125):GRAPHICS 0
10 DL=PEEK(560)+PEEK(561)*256:POKE DL+16,
   130
20 FOR J=0 TO 10:READ B:POKE 1536+J,B:NEX
   T J
25 DATA 72,169,42,141,10,212,141,24,208,104
   ,64
30 POKE 512,0:POKE 513,6
35 POKE 54286,192
40 GOTO 40
```

The steps for composing a DLI routine in BASIC are:

(1) Plan your display.
(2) Insert the interrupt instruction into the Display List.
(3) Write the DLI service routine.
(4) Put in the instructions that will allow the routine to be carried out.

Now examine Program 1 in detail. The change in the display (step 1) is simple — we will alter the background color of a Graphics 0 display half-way down the screen. To better understand step 2, refer to Table 1, which is a Graphics 0 Display List. There are 24 Graphics 0 mode line instructions: byte 3 (which is also a load memory scan instruction), and bytes 6 through 28. (For more information on Display Lists, see our article in ANTIC #6). We will put our DLI instruction at byte 16, the twelfth Graphics 0 mode line. The interrupt instruction is the ANTIC mode number plus 128. The color change will occur at the next mode line. *This is a general rule — the change you are making will occur at the mode line following the DLI instruction.* Thus, line 5 of Program 1 clears the screen and calls for a Graphics 0 display. Line 10 finds the starting address of the Display List and then POKEs the value 130 into the proper memory location.

We are now ready to write the service routine (step 3). Before we get into the details of 6502 registers and instruc-

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START INTERRUPTING *continued from page 24*

tions it is important to note that a Display List service subroutine for the CPU must be short. The reason is that the data for the color changes must be put in place during the horizontal blank. The horizontal blank is the time that the electron beam is turned off as it returns from the right side to the left side of the TV screen. In this relatively short interval, there is just enough time to make three color changes. In this program we make one color change. In Program 2 we illustrate how to make three color changes.

Recall that the function of the 6502 is to manipulate data in the form of 8-bit bytes. Three registers are used to hold this data: the accumulator, the X-register, and the Y-register. The accumulator is the primary register, because it has the greatest variety of commands available for data manipulation. The instructions to the accumulator, and the X and Y registers are also 8-bit binary numbers. As an example, 10101001 is the *instruction* to load the accumulator with the number immediately following. Since people have trouble remembering long binary numbers, instructions are given three-letter codes called *mnemonics*. For instance, the mnemonic for "load the accumulator" is LDA. When you write a program using mnemonics, it is called Assembly Language programming.

The nice part about learning the rudiments of Assembly Language programming through DLIs is that you need only to concern yourself with a simple form of addressing called the *immediate mode*.

In immediate mode, the mnemonic always precedes its data. Table 2 gives a list of Assembly Language commands useful in writing DLI routines and their corresponding numerical codes.

The following is the procedure for constructing the DLI routine used in Program 1:

STEP 1

Save the value that is in the accumulator. This value must be saved because it is part of the program that the CPU was executing before the interrupt. The place to store this value is the *stack*. The stack is a special area of memory that operates on a last-in-first-out basis. The mnemonic PHA stores the contents of the accumulator on the stack.

STEP 2

Load the accumulator with the numeric value corresponding to the color yellow. The command to do this is LDA followed by 42 (decimal).

STEP 3

Tell the 6502 to wait for the horizontal blank. This insures that the color change starts at the left side of the screen and will be clear and sharp. The command to do this is STA WSYNC. WSYNC stands for the address 54282. This address must be presented to the CPU in two bytes. The first byte is called the low byte and is the *remainder* (not quotient) of the address divided by 256. The high byte is the quotient. For example, the LO-byte HI-byte form of WSYNC is 10, 212.

STEP 4

Take the color value (42), still in the accumulator, and store it in the GTIA register at memory location 53272. The instruction for this is STA 24, 208. (24 = LO-Byte; 208 = HI-Byte of 53272).

STEP 5

Recall the original accumulator contents from the stack. This command is PLA.

STEP 6

Return from the interrupt routine. The command is RTI.

In Assembly Language mnemonics this program can be written compactly as:	*Since our BASIC program can't understand mnemonics they must be translated into decimal:*
PHA	72
LDA	169,42
STA WSYNC	141,10,212
STA ADDR	141,24,208
PLA	104
RTI	64

The decimal values of the Assembly Language program are put into the BASIC program as DATA in line 25. The previous line, line 20, writes this subroutine at the start of Page Six, i.e. memory location 1536 and following.

TABLE 1

GRAPHICS 0 DISPLAY LIST—48K SYSTEM

BYTE ADDRESS	NUMBER	VALUE	
39968	0	112	24 blank scan lines.
39969	1	112	
39970	2	112	
39971	3	66	Load Memory Scan, first mode line
39972	4	64	Screen Memory Address
39973	5	156	
39974	6	2	Instructions for 23 Mode Lines of Graphics 0.
39975	7	2	
•	•	•	
39982	14	2	
39983	15	2	
39984	16	2	
39985	17	2	
39986	18	2	
•	•	•	
39996	28	2	
39997	29	65	JVB
39998	30	32	LO-Byte
39999	31	156	HI-Byte

Finally, in order for the DLI routine to be executed, we must do two things. We must store the starting address (1536) of the DLI routine for the CPU in memory locations 512 (LO-Byte) and 513 (HI-Byte). Then the Display List Interrupt must be "enabled". Line 30 takes care of the first task. Line 35 takes care of the second. It is important to know that when ANTIC encounters a DLI instruction in the Display List, it will check to see if the enabling value 192 has been stored at 54286. If not, the DLI instruction will be ignored. Furthermore, in the BASIC program, the enabling instruction POKE 54286,192 must come after the DLI routine is read into memory. Otherwise your program will crash.

Since we are using Display List Interrupts to make color changes, a little color information might be helpful. The ATARI has two sets of color registers: the hardware registers and their corresponding shadow registers. We have listed the registers and their addresses in Table 3. The hardware registers are used by GTIA to determine the colors to be put on the screen. During the vertical blank the OS reads the values in each shadow register and writes them into the appropriate hardware register. Now you can see why Program 1 splits the screen into two colors. We changed the hardware register from blue to yellow with the DLI. However, the value in the shadow register is still blue, so during the vertical blank the OS changes the color value of the hardware register back to blue.

Program 1 makes a single color change at a single location on the screen. There are two good ways to build on this simple program. One way is to cause up to three color changes in one interrupt routine. A second way is to use multiple DLI routines. Program 2 illustrates how to make three color changes with one interrupt routine by using the accumulator, the X-register, and the Y-register. In this program we change the foreground, background, and border colors half-way down the screen.

The Assembly Language program to accomplish these changes is:

STEP I: Save the accumulator, the X-register and the Y-register onto the stack.

MNEMONIC	DECIMAL VALUE	FUNCTION
PHA	72	save accumulator
TXA	138	transfer X to accumulator
PHA	72	save accumulator
TYA	152	transfer Y to accumulator
PHA	72	save accumulator

STEP II: load register.

LDA	169, 42	load accumulator with yellow
LDX	162,192	load X with dark green
LDY	160, 92	load Y with pink

STEP III: Wait for horizontal blank. Store colors.

STA WYSNC	141,10,212	wait for horizontal blank
STA COLOR1	141,24,208	yellow to background register
STX COLOR2	142,23,208	dark green to foreground
STY COLOR3	140,26,208	pink to border register

STEP IV: Restore the accumulator, X and Y registers.

PLA	104	recall top value on stack into accumulator
TAY	168	transfer it to Y register
PLA	104	recall next value on stack
TAX	170	transfer it to X register
PLA	104	recall original accumulator value

STEP V: Return from interrupt.

RTI	64	return

As in Program 1, the decimal code corresponding to this routine is entered in the program as DATA (lines 25 and 30) and is written into Page Six by line 20.

Programs 1 and 2 are simple examples that show how to set up DLI routines. Program 3 illustrates using a DLI routine in conjunction with a custom display list. This program sets up two sections of text (GR. 2, GR. 1) and draws a daisy in the Graphics 8 portion of the screen. After the display has been drawn, a DLI routine changes the colors of the display. There is a short pause for you to view the screen in its new colors. Then in line 350 the DLI is disabled by POKEing in 54286,64. We believe that this little program is an indication of the many possibilities awaiting you in using Display List Interrupts.

Program 2

```
 5 GRAPHICS 0
10 DL=PEEK(560)+PEEK(561)*256:POKE DL+16,
   130
20 FOR J=0 TO 28:READ B:POKE 1536+J,B:NEXT
   J
25 DATA 72,138,72,152,72,169,42,162,192,160,
   92,141,10,212,141,24,208
30 DATA 142,23,208,140,26,208,104,168,104,1
   70,104,64
35 POKE 512,0:POKE 513,6
40 POKE 54286,192
45 POKE 752,1:REM TURN OFF CURSOR
50 POSITION 6,11:? #6;
   "DISPLAY LIST INTERRUPT"
55 POSITION 5,12:? #6;"WITH THREE COLOR C
   HANGES"
60 POSITION 0,0:POKE 752,0:REM RESTORE CU
   RSOR
```

WORKS WITH 1200XL

continued on next page

Program 3

```
5 ? CHR$(125):POKE 752,1
  :REM CLEAR SCREEN, TURN OFF CURSOR
10 REM SET UP CUSTOM DISPLAY LIST
15 GRAPHICS 8+16:SETCOLOR 2,0,0
20 DL=PEEK(560)+PEEK(561)*256+4
30 POKE DL-1,71
40 POKE DL+2,7+128:REM PUT IN DLI INSTRU
  CTION
50 FOR I=0 TO 3:POKE DL+132+I,6:NEXT I
60 POKE DL+136,65
70 POKE DL+137,PEEK(560):POKE DL+138,PEE
  K(561)
80 POKE 87,2
90 POSITION 4,0:? #6;"DISPLAY LIST"
100 POKE 87,8
110 TPSCRN=PEEK(88)+PEEK(89)*256
120 TPSCRN=TPSCRN+41
130 POKE 88,TPSCRN-(INT(TPSCRN/256)*256)
140 POKE 89,INT(TPSCRN/256)
145 REM DRAW DAISY
150 COLOR 1:FOR T=0 TO 360 STEP 3
160 W=T/57.26
170 R=30*SIN(6*W)
180 X=INT(R*COS(W))
190 Y=INT(R*SIN(W))
200 IF T=0 THEN PLOT 160+X,64-Y
210 DRAWTO 160+X,64-Y:NEXT T
220 POKE 87,1
230 TPSCRN=TPSCRN+5121
240 POKE 88,TPSCRN-(INT(TPSCRN/256)*256)
250 POKE 89,INT(TPSCRN/256)
260 POSITION 3,2:? #6;"INTERRUPTS"
265 REM DISPLAY LIST INTERRUPT ROUTINE
270 FOR J=0 TO 28:READ B:POKE 1536+J,B:NE
  XT J
280 DATA 72,138,72,152,72,169,80,162,152,16
  0,88,141,10,212,141,23,208
290 DATA 142,22,208,140,24,208,104,168,104,
  170,104,64
300 POKE 512,0:POKE 513,6
330 POKE 54286,192
340 FOR DELAY=0 TO 500:NEXT DELAY
350 POKE 54286,64
360 GOTO 360
```

WORKS WITH 1200XL

TABLE 2

ASSEMBLY LANGUAGE FOR DISPLAY LIST INTERRUPTS

MNEMONIC	NUMBER CODE DECIMAL	HEX	FUNCTION
PHA	72	48	*Push value in accumulator to the stack.*
TXA	138	8A	*Transfer X-register to accumulator.*
TYA	152	98	*Transfer Y-register to accumulator.*
LDA	169	A9	*Load accumulator with number following this code.*
LDX	162	A2	*Load X-register*
LDY	160	A0	*Load Y-register*
STA	141	8D	*Store value in accumulator.*
STX	142	8E	*Store value in X-register.*
STY	140	8C	*Store value in Y-register.*
TAX	170	AA	*Transfer accumulator to X-register.*
TAY	168	A8	*Transfer accumulator to Y-register.*
PLA	104	68	*Load value on top of stack into accumulator.*
RTI	64	40	*Return from interrupt.*

Special Command:

STA WSYNC	141,10,212	*This command tells the CPU to wait to do the instructions following it during the horizontal blank.*

TABLE 3

COLOR LOCATIONS

NAME	SHADOW ADDRESS	HARDWARE ADDRESS DECIMAL	LOW-BYTE	HIGH-BYTE
Player 0	704	53266	18	208
Player 1	705	53267	19	208
Player 2	706	53268	20	208
Player 3	707	53269	21	208
Color Reg. 0	708	53270	22	208
Color Reg. 1	709	53271	23	208
Color Reg. 2	710	53272	24	208
Color Reg. 3	711	53273	25	208
Color Reg. 4	712	53274	26	208

AUTOBOOT FOR BASIC

Load-and-go cassettes or disks

by ERIC VERHEIDEN

These programs show you how to turn your tokenized (SAVE'd) ATARI BASIC program into an autobooting cassette or disk. The program will load-and-go automatically, just like machine language programs. You will require the ATARI BASIC and Assembler Editor cartridges along with your disk drive or cassette recorder.

The system works by loading the BASIC token file to a suitable address with a program used with the Assembler Editor cartridge, and inserting a short header program in front of the token file. This, upon loading, sets up the pointers required by BASIC and then jumps into the BASIC cartridge at the address of the RUN routine. A suitable return address is provided by pushing values onto the stack. A third program is then used to dump the header and token files onto cassette or non-DOS disk.

The program relies upon the ATARI BASIC structure of variable subroutine calls that are based on command token value (for a discussion of the structure of ATARI BASIC, see *De Re ATARI*). The subroutine addresses (–1) for operator tokens are stored in a table starting at address $AA00 in MSB, LSB format. After the RUN command, most Page Zero values used by BASIC are reinitialized. Some significant exceptions are the BASIC pointers (stored from $80 to $91), the break key flag (set at $11) and the spacing for a ',' in a BASIC PRINT statement (stored at $C9). These values are all set by the header program before jumping into the BASIC cartridge. The program itself resides in the tokenizing area set aside by BASIC and is overwritten after execution.

This system is somewhat different from other load-and-go systems in that it does not use handlers and separate header or AUTORUN.SYS files to boot the program. As such, the loading is faster (particularly for disk) and it allows the convenience of dealing with a single monolithic file. For disk programs, there is 5K additional memory space because DOS is not used.

The load/dump routines are somewhat unpolished, but have the advantage of fitting into a single page of memory. To load a DOS or cassette BASIC file, first boot up the Assembler Editor cartridge (with DOS, if applicable). The load/dump routine may now be LOADed (from disk) or ENTERed, as applicable. See your Assembler Editor manual for details. Note that the PST value is arbitrary; it must in any case be located beyond the source text file, if any (allow a minimum of $200 bytes from LOMEM in any event). After the routine is LOADed into memory at Page Six (or before the source is assembled), the name of the file to be loaded must be assembled into location $670. If the program is left as listed, loading will take place off cassette.

To overwrite the "C:" filename, assemble a short program of the form:

```
1000 *=      $670
1010 .BYTE "D:MYPGM.BAS",$9B
1020 .END
```

Next, LOAD or ENTER the header program and assemble, if appropriate. If you are ENTERing a new program, be sure to type NEW first. PST should match for the load/dump routine and the header routine.

Now you are ready to load the BASIC file. This is accomplished by setting up the appropriate disk or tape and typing in:

```
BUG
G6E0
```

Finally, you are ready to write the program out to a boot disk or tape. If writing to cassette, erasing is suggested before writing. Also, the loader program must be reset (to "C:",$9B) at location $670 if the BASIC program was loaded from a disk file. Type in:

```
G680
```

For disk, make sure the disk in drive 1 has no useful files (like your BASIC source, for instance). To format the disk before writing, use:

```
G600
```

To write without formatting, use:

```
G617
```

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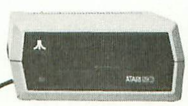
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Computer Model__________ Disk ☐ Tape ☐

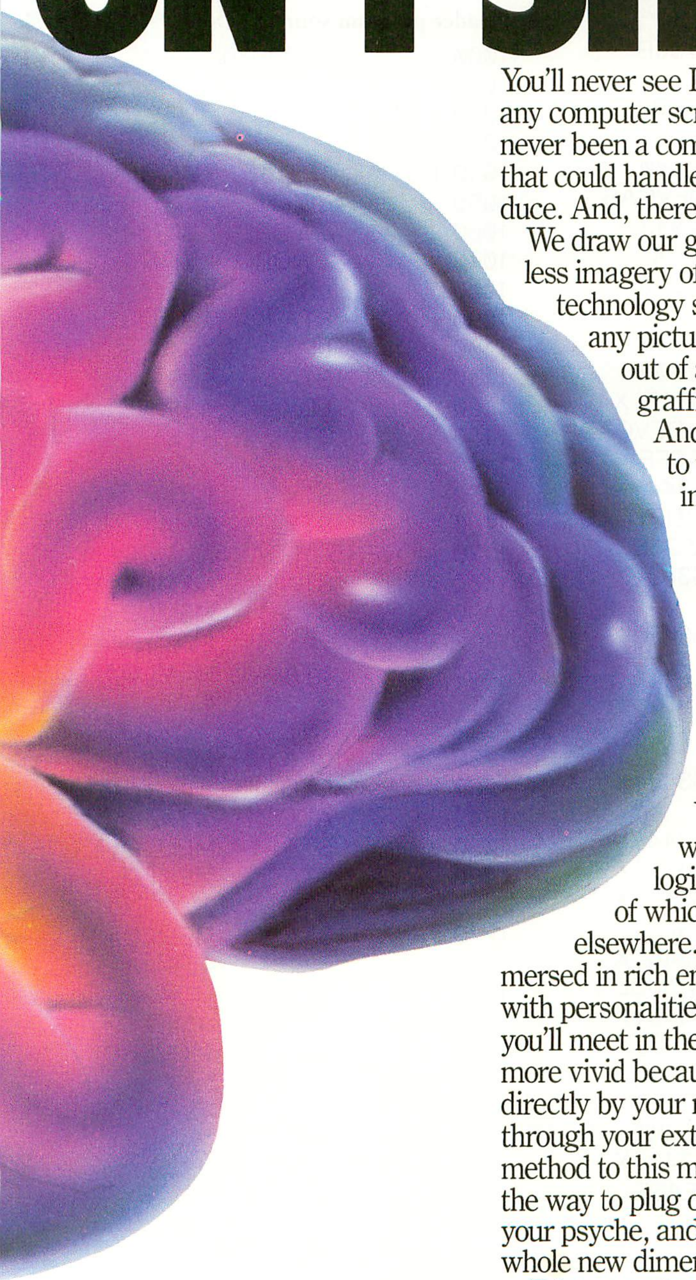
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AUTOBOOT FOR BASIC

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Load / dump routine source:

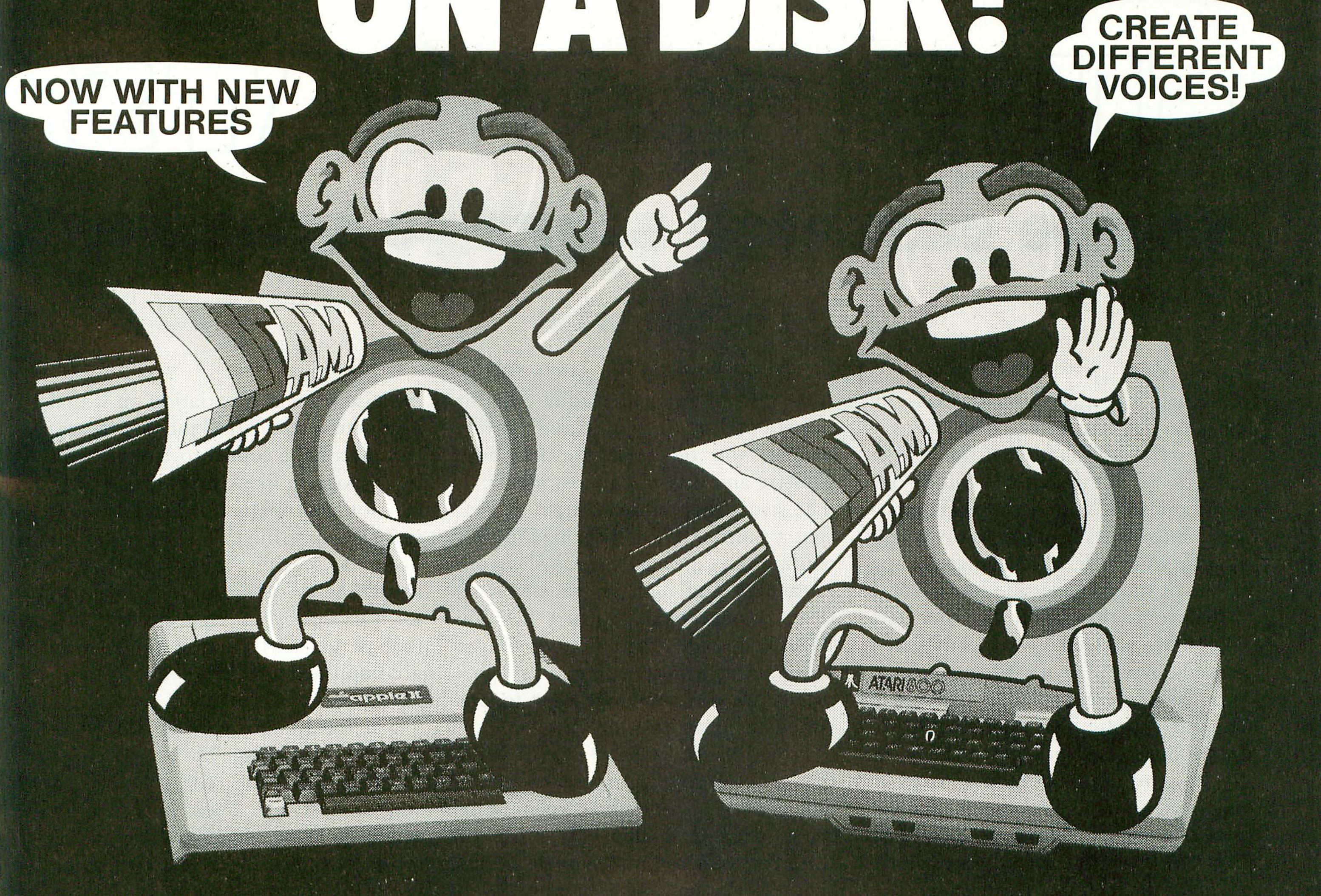
```
1000          *=       $0600
1010 ;
1020 PST      =        $4000
1030 ;
1040 ; SAVE TO BOOT DISK
1050 ;
1060 FORMAT  LDA       #1
1070         STA       $301
1080         LDA       #0
1090         STA       $304
1100         LDA       #4
1110         STA       $305
1120         LDA       #$21
1130         STA       $302
1140         JSR       $E453
1150 ;
1160 DMPDSK  JSR       CTBOOT
1170         LDA       #1
1180         STA       $301
1190         STA       $30A
1200         LDA       #$57
1210         STA       $302
1220         LDA       #0
1230         STA       $304
1240         LDA       #PST / 256
1250         STA       $305
1260         LDA       #0
1270         STA       $30B
1280 JMPDSK  JSR       $E453
1290         INC       $30A
1300         CLC
1310         LDA       $304
1320         ADC       #$80
1330         STA       $304
1340         LDA       $305
1350         ADC       #0
1360         STA       $305
1370         DEC       NUMSEC
1380         BNE       JMPDSK
1390 ;
1400 NUMSEC  .BYTE     0
1410 ;
1420 ; GET SECTOR COUNT
1430 ;
1440 CTBOOT  LDA       PST+$FF
1450         STA       PST+1
1460         LDA       PST+$FE
1470         ROL       A
1480         ROL       PST+1
1490         INC       PST+1
1500         LDA       PST+1
1510         STA       NUMSEC
1520         RTS
1530 ;
1540         *=        $670
1550 ;
1560 ; DEVICE NAME
1570 ;
1580 DEVCAS  .BYTE     "C:",
     $9B
1590 ;
1600         *=        $680
1610 ;
1620 ; DUMP TO CASSETTE
1630 ;
1640 DMPCAS  JSR       CTBOOT
1650         LDA       #$00
1660         PHA
1670         LDA       #$0B
1680         PHA
1690 GETFIL  AND       #$0C
1700         PHA
1710         LDA       #$80
1720         LDX       DEVCAS
1730         CPX       #$43
1740         BEQ       *+4
1750         LDA       #$00
1760         PHA
1770         LDX       #$30
1780         LDA       #$03
1790         STA       $342,X
1800         LDA       #DEVCAS
                       &$FF
1810         STA       $344,X
1820         LDA       #DEVCAS
                       / 256
1830         STA       $345,X
1840         PLA
1850         STA       $34B,X
1860         PLA
1870         STA       $34A,X
1880         JSR       $E456
1890         PLA
1900         STA       $342,X
1910         PLA
1920         STA       $344,X
1930         LDA       #PST / 256
1940         STA       $345,X
1950         LDA       #0
1960         STA       $348,X
1970         LDA       NUMSEC
1980         STA       $349,X
1990         LSR       $349,X
2000         ROR       $348,X
2010         JSR       $E456
2020         LDA       #$0C
2030         STA       $342,X
2040         JSR       $E456
2050         BRK
2060 ;
2070         *=        $6E0
2080 ;
2090 ; LOAD FILE
2100 ;
2110 LOAFIL  LDA       $2E6
2120         CLC
2130         SBC       #PST / 256
2140         STA       NUMSEC
2150         ASL       NUMSEC
2160         LDA       #$F2
2170         PHA
2180         LDA       #$07
2190         PHA
2200         JMP       GETFIL
2210 ;
2220         .END
```

Header program source:

```
1000         *=$4000
1010 ;
1020 MEMLO    =        $80
1030 ;
1040 PST     .BYTE     0
1050         .BYTE     0
1060         .WORD     $0700
1070         .WORD     $E474
1080         LDA       #$3C
1090         STA       $D302
1100         LDA       #$0A
1110         STA       $C9
1120         LDY       #$FF
1130         STY       $11
1140         INY
1150         STY       $2C8
1160         STY       $244
1170 MOVEHD  LDA       $07F2,Y
1180         STA       MEMLO,Y
1190         STA       MEMLO+
                       2,Y
1200         STA       MEMLO+
                       4,Y
1210         INY
1220         LDA       $07F2,Y
1230         CLC
1240         ADC       #$07
1250         STA       MEMLO,Y
1260         STA       MEMLO+
                       2,Y
1270         STA       MEMLO+
                       4,Y
1280         INY
1290         CPY       #$0E
1300         BCC       MOVEHD
1310 ;
1320         LDX       #$FF
1330         TXS
1340         LDA       #$A9
1350         PHA
1360         LDA       #$61
1370         PHA
1380         JMP       $B74D
1390 ;
1400         .END
```

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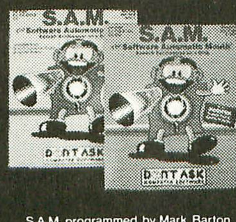
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FILE FORMATS

Three cassette storage schemes

by CARL EVANS

This article begins a new series on cassette file structures. Right now I could write a book on the subject, but since that is not practical, I will hit one topic at a time, with occasional digressions into issues brought to my attention by you readers. This introduction is one of those reader-induced pieces.

The topic this month is "what is a file?" The answer is very complex. I see ads every day for programs that promise to solve all of your troubles in copying cassette files, and because I'm in the business, I buy all of them. As for cassette utility programs listed in magazines, I either type the program in myself or get them from the publisher. You, on the other hand, are pretty much at the mercy of the purveyors of such programs. This article will help you know what questions to ask about the next nifty cassette program you are thinking of buying.

BASIC files are somewhat different from machine language "BOOT" files. Most of you understand some of the differences between CSAVE, LIST"C, and SAVE"C BASIC files. If you don't, then hang on until I get to those details in a future article. However, even the more informed of you are still fuzzy when it comes to telling the difference between the various kinds of BOOT files.

The most common type of BOOT file is the ordinary single-stage, single-file program. Let's call these "normal" BOOT files. These are the kinds of files that something like CBOOTMGR (see ANTIC #6) will readily copy or upload to disk. Such files are relatively simple, the file structure for both cassette and disk are almost identical. The structure is close enough, in fact, that a simple GET-BYTE:PUT-BYTE routine can take one of these files from a cassette and directly transfer it to disk, or vice-versa. Such a file will BOOT normally and nobody is the wiser. Alas, most commercial programs are not anywhere near to this simplistic ideal.

Programs like CBOOTMGR do a nice job of copying some programs and a nice job of uploading most of those programs. But you probably have run into a number of programs that it can't copy, and even more that it can't upload. The problem is that CBOOTMGR only does the mission it was designed for. A flathead screwdriver works fine for driving flathead screws, but falls short when it comes to phillips-head screws. The problem in this case is very similar.

BOOT files come in three basic types, and to further complicate the situation, the three basic file structures can be combined with one another. The first type, the "normal" BOOT, is a single-stage, single-file collection of 128-byte records.

The second type is the single-stage, multi-file program. A good example of this type of program is the game with a small loader file that displays a title page before automatically loading the actual game. Remember this format because there is a variation on it that I'll discuss later. This kind of program can usually be copied to another tape by a program like CBOOTMGR, but can not be properly transferred to disk since the first file calls the second file using a machine-language cassette loader. Some modification is required for it to work properly from disk, and that is not a trivial task for even an accomplished machine-language programmer.

The third major type of boot file is called a "multi-stage" boot file. Please don't confuse this with the single-stage, multi-file boot program. A multi-file boot program contains a separate end-of-file marker for each file, while a multi-stage boot program generally has only one end-of-file marker. The only multi-stage boot programs I have seen are typically *very* large programs that can't be loaded in a single-stage (normal) boot. This means that the program has more than 255 sectors. The Lords of Karma and Empire of the Overmind adventure games fall into this category.

Your normal cassette copy program bogs down on this type of file and fails to give you a good copy. This type of program is even more difficult to transfer to disk since the nature of the multi-stage boot can vary considerably. This means that an upload program will successfully upload this kind of program only if the particular multi-stage sequence of that program has

continued on page 38

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FILE FORMATS

continued from page 36

been anticipated. Fortunately, this boot format is not widely used for commercial programs.

Many game companies are using a modified, single-stage, multi-file format. The first file will load normally and can be copied by any boot-file copier, but the second file just won't seem to copy. The reason is simple, but not very well known. The first file is a normal 128 byte-per-sector file which alters the way the computer looks at cassette files. The ones I have analyzed alter the byte-per-sector format from 128 (default) to 146, or to some other odd-ball number.

The net result is that if you try to copy one of these programs using the normal CIO routine, the copy won't work. The only way you can do it is to get down to the SIO level. If this sounds like Greek to you, don't worry, you are not alone.

The real gripe I have with altered-sector-length "copy protection" is that the programs are almost impossible to upload to disk. The file structure in a disk file is locked into the system's standard format, since the disk controller is isolated from user intervention.

In upcoming issues I will discuss each of the major file formats for both BASIC and BOOT files and try to explain some of the complexities of cassette file structures. As I go along I will toss in a routine here and there I have found useful in either analyzing, copying, or uploading the various kinds of files.

If I don't cover the particular area that you need to know about, then write to me about your question and I either will answer it with a column devoted to that specific topic or give you a brief answer in Tangle Angles.

Tangle Angles

My recorder will playback its own tapes; however, it won't playback those of my friends. I was told that this is a problem due to different head alignments. Is there a kit that I could use to align the head myself? Would it be possible to use a better quality recorder, such as Sony or Panasonic, and if so, what filters would I need?

Dr. John G. Golden
Dayton, OH

There is no commercial head alignment kit for the Atari 410 Recorder, but you can easily make your own. The details are too lengthy to go into here, so I will use my next column to answer you in depth. In the meantime, don't worry about it since the proper head alignment won't cure your problems anyway.

In one of my recent columns (see ANTIC #5) I explained why you have to use the Atari recorder with your computer and cannot use any other commercial recorder.

I am presently on my third cassette recorder and, at best, I am only able to save fifty percent of the programs. The computer checks out okay. I have meticulously marked the beginning, used an "L" Print before "C" Saving, and still lost programs.

W.P. Keryluk
Portage la Prairie,
Canada

The problem sounds like it stems from a bad POKEY chip and although you state, "the computer checks out okay," I have my doubts. Most of the people I know who have had recorder after recorder malfunction have solved the problem by having the POKEY chip replaced. Take the computer to a certified service center and specifically ask them to check the POKEY chip.

Many of us are stuck with multi-stage boot cassettes that we can't convert; also, they take *so long* to load. I have three such cassettes, and since getting my disk drive, I need a program to load them on disk. In addition, how does machine code do away with the lead tone usually required on cassette?

Lawrence Blouir

The first problem we have to handle is terminology. I suspect that what you are calling a "multi-stage" load program is what I refer to as a "single-stage, multi-file" (SSMF) program. See my article in this issue of ANTIC for a detailed explanation of the terms.

If you are trying to upload a "multi-stage" file or an unprotected SSMF program, then something like Vervan's CASDIS program will do the trick. However, if what you are hoping to upload is a protected SSMF program, then you are probably out of luck.

There is no way I know of to simply transfer such programs to disk since

the record length (sector length) of a disk file is not alterable by the user.

Your other question has a better answer. The leader tones on a cassette are only used by the operating system to establish the input baud rate for that cassette file. Once such a file has been loaded into memory, the write-to-disk routines dump the data (program) to a disk file without bothering to send out the unnecessary baud rate tones.

The counter on my recorder has broken and I have no way of knowing where a program starts. Can I use a POKE to identify the start points of any program on a tape? Is there a book with technical aspects defined?

Mike Evans
Ontario, Canada

There are two simple ways to find a file on a cassette. The first is to play the tape through a normal recorder (not the 410) until you can hear the sound of the program, then rewind the tape to just before the program, and then transfer the tape to the 410 Recorder. This is awkward at best.

I usually use the PACTL trick. Poking the PACTL location 54018 with a value of 52 will turn the 410 motor on. Normally this will allow you to listen only to the audio channel on the tape. However, if you turn the volume on your TV way up, then you can hear the actual start of the program on the other channel.

Note that you should POKE 54018, 60 to turn the motor line back off.

If you are interested in the more technical aspects of the cassette recorder, then I would suggest that you read De Re Atari *and the* Technical User Notes *both of which are available from Atari.*

You requested any sources for ATARI parts. Pass the word to your readers that *we* have a very good inventory of parts. The number of each part on hand is limited and we must limit the numbers sold from our service department inventory. If any of the ANTIC readers need a part, have them call or write:

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Oregon, Ohio 43616
(419) 691-7282

Robert Rusch
Vice President

This is the first letter from anyone other than a consumer. If you readers have any other good sources for parts, then let me know and I will help to spread the good word.

It is extremely difficult to put "unprotected" cassettes into my 410. "Protected" tapes, with the tab punched out, are okay but I need to use a thin knife to push the tape back before it will clear the read/write head and the attached tape guide. My children have broken it twice, by pushing a tape in and pushing the lid shut without using *extreme* caution.

Gerry Wick
Los Angeles, CA

Your problem is not a common one. The recorder should accept both "virgin" tapes as well as those with the write-protect tab punched. If you are having a problem physically loading either type of tape, then the recorder is defective and should be replaced or sent to a repair center.

The head alignment of our first 410 did not hold. We obtained a replacement under warranty. We wonder if current problems are due to a "floppy" head.

Tapes we have CSAVED on our 800 often will not CLOAD on our 800, but will on another 800.

Sometimes commercial tapes will not CLOAD.

A tape which was LIST "C:" 'd will not load.

The error is usually 138 or 143.

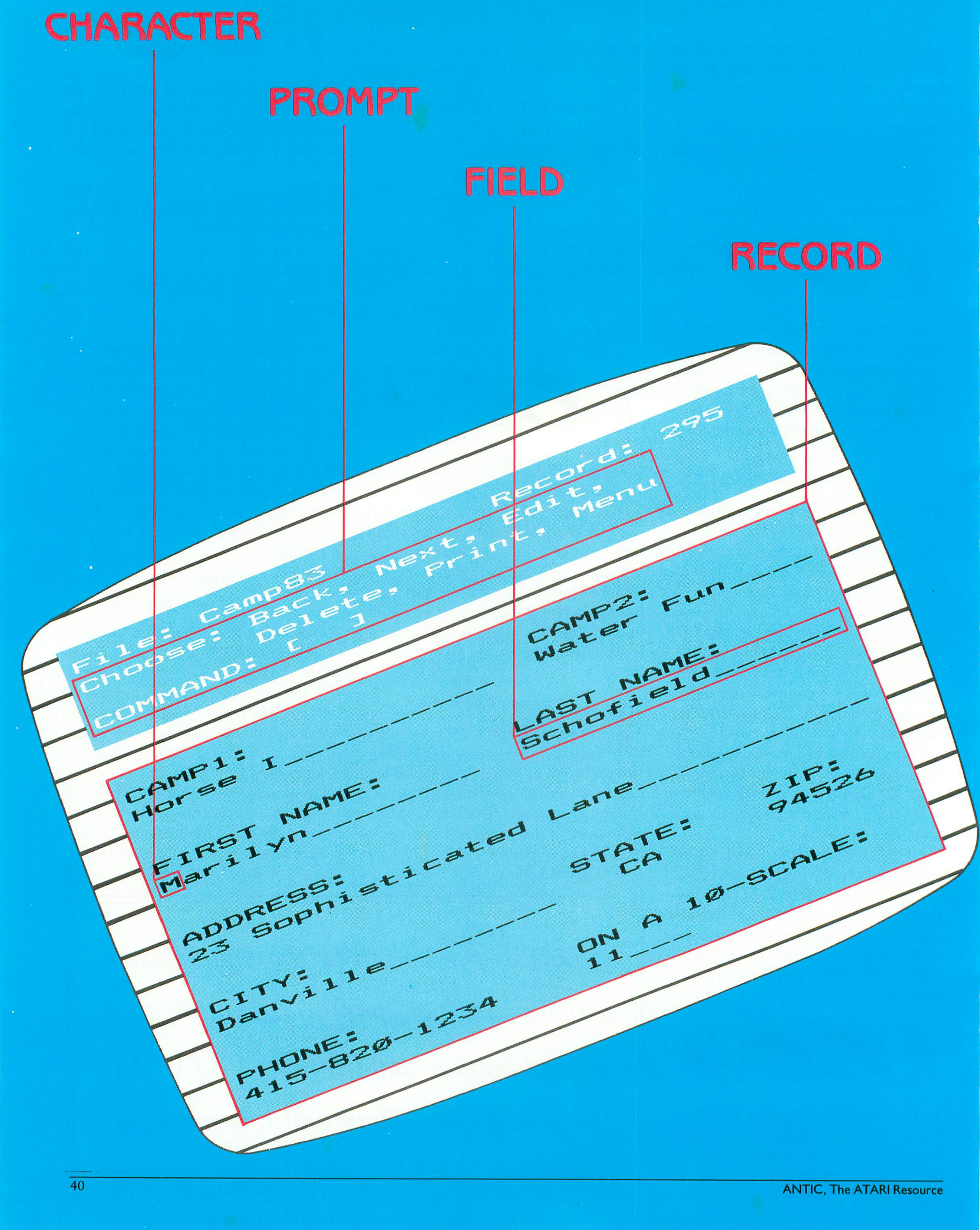
Sometimes by varying the starting point on the tape, it will load. Where one starts the tape is very critical. Plus or minus on the counter of one unit is crucial. The clatter sound of the loading, and the loading, is highly dependent on the point at which the tape is started. This is in spite of the fact that we are supposed to have the model in which one needn't wind the tape past the leader.

Robert Orr
Wilmington, DE

Head alignment should be checked after every 100 hours of use. Alignment should not vary much during that interval. The 410 I am using now has over 200 hours of use on it and the heads are still within the factory specs. A recorder with a 'floppy' head is defective.

All of your loading problems sound like you have a problem with the active filters. Try the 'reliability fix' I suggested in my article and you should notice a marked improvement.

Due to the length of the Data-Base articles, we have postponed publication of our regular departments PILOT and DragonSmoke. They will return in July.



CHARACTER
PROMPT
FIELD
RECORD
File: Camp83 Record: 295
Choose: Back, Next, Edit,
Delete, Print, Menu
COMMAND: [ ]
CAMP1:
Horse I
CAMP2:
Water Fun
FIRST NAME:
Marilyn
LAST NAME:
Schofield
ADDRESS:
23 Sophisticated Lane
CITY:
Danville
STATE:
CA
ZIP:
94526
PHONE:
415-820-1234
ON A 10-SCALE:
11

DATA BASE BASICS

An overview

by KEN HARMS

People display a seemingly insatiable desire to keep track of information. My wife is organizing data on 600 Girl Scouts for their summer camp. I have a file of participants in a research study. My neighbor's job requires tracking the court appearances of various miscreants. All of these chores cry out for an efficient way to store and use information, and in answer we have the computerized Data-Base Management System (DBMS).

This issue of ANTIC surveys most of the DBMS products available for the ATARI. This article introduces DBMS concepts and terminology, and explains how to determine if using one will really make your work easier. Other articles will survey the features and functions of specific systems.

HOW DATA ARE ORGANIZED

Field Number Field Name	Field 1 Name	Field 2 Address	Field 3 City / State	Field 4 ZIP
Record 1	Jones	27 Way Ct.	Alamo, TX	94949
Record 2	Thomas	35 My Street	Chico, CA	94959
Record 3	Roberts	18 Her Street	Reno, NV	96999

FIELDS are groups of characters describing a logical piece of data. Records are groups of fields describing a total unit of information, in this case the name and address of a person. A file is a collection of records. In this example, only three records constitute the file.

For our purposes, the smallest unit of data manipulated by a DBMS is the *character*. Characters are letters, numbers, punctuation marks and other symbols that can be entered from the keyboard. The ATARI also generates "graphics characters," but most data bases don't accept them. A single character may be meaningful by itself, for example, the numeral "2" or the letter "a." Characters can also be grouped logically, for example, the number "25" or the word "monkey."

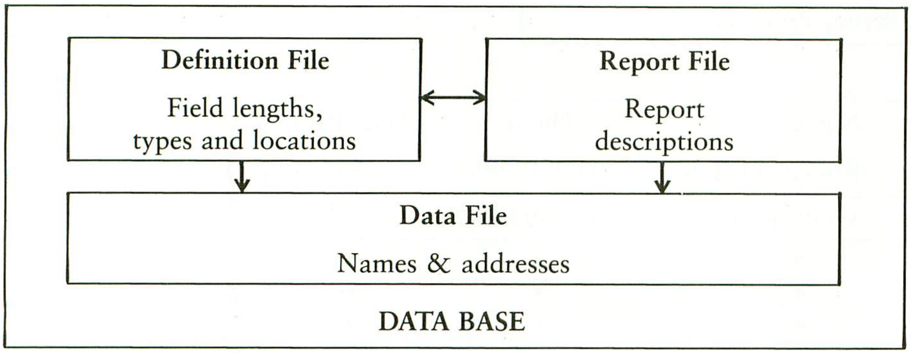
Characters, grouped or standing alone, are the data. All data must appear in appropriate, designated places, and these places are called *fields*. A field is an area within each record where data of a particular kind is entered and stored. For example, a field to hold a name might be called the NAME field. Every field must have a stipulated length, so let's give NAME field a length of ten character spaces. This will accomodate names like "Smith" or "Richardson," but "Stanislavsky" will be chopped off at the "k." Fields may also be restricted to either alphabetic or numeric characters in some instances.

A *record* is a group of related fields which contain all the information about the particular thing or person to which the record relates. The title, author, publisher and subject of a book, for instance, would be a record. Records have several characteristics, such as number of fields and relationship to other records.

A *file* is a related set of records all of which share an identical file structure. All the book title cards in a library constitute a file. The author cards are a separate file. Files are usually referred to by name, or by the type and number of records they contain. In addition to files of data entered by users, a DBMS will create and use special files which

describe the records, fields and characters in a file, or define the reports the user wishes to see.

A *data base* is a set of related files. In the systems now available for the ATARI, a data base consists of files created by users, plus several auxiliary files. One of these, the definition file, contains descriptions of records (field name, number, length, type, etc.). Another, the report file, describes characteristics of reports such as which fields to print, where to print them, which fields to subtotal, and which order to list the records.



A DATA BASE consists of related files. A definition file describes the record in terms of field lengths and types. A report file describes report characteristics such as which field to print, where and when to subtotal which fields. A data file contains user data such as names or amounts. Files with pointers to data records for random access are often required but are invisible to the user.

Finally, a *Data-Base Management System* is a set of computer programs which allows you to create records, fields and reports, enter data into files, and delete, change, search, and sort those data. In larger computers a DBMS allows you to use several data files simultaneously. DBMSs for the ATARI, however, are limited to one data file and are, therefore, often called file management systems.

The programs in a Data-Base Management System will ask you how you want your data recorded (the file definition program), and then let you enter and revise your data (the data entry-update section). You'll then be able to search through your records to locate specific data you need and sort the file into the order you wish (the search/sort module). The report writer section of the system will ask you how you want your records printed and will then produce lists of your file on the screen or printer. Finally, some of the systems will let you build new files from the data in one or several existing files (the merge/reorganize program).

THE BENEFITS OF DBMS

It's easy to write by hand various information about the 250 contestants in your tennis tournament. The computer won't save time there; unless you're an excellent typist, data entry will be slower than handwriting. But when you need to write all those names on envelopes, or when the tournament director requests both an alphabetical list and a list by club affiliation, your typing time will have been repaid many times over.

Flexibility is the keyword for a good DBMS. Flexible systems allow you to define records as you collect the data, and then change that definition as your needs change. You'll be able to search quickly for specific records, then change the data in them (when a player moves, for instance). You'll be able to sort your records into different sequences for different reports. Finally, the full-scale systems will allow you to describe different reports with different fields in different sequences with subtotals and totals on the fields you wish. Often, the system will compute results from data you've entered; a sales value, for instance, by multiplying number of units sold by selling price.

Since these systems are necessarily complex, the designers put great effort into making them easy to use. Prompts on the screen ("Load this file?") or "help" screens with full pages of the manual are available in a good system. And, of course, the DBMS is useless if it isn't error-free.

DO I NEED A DBMS?

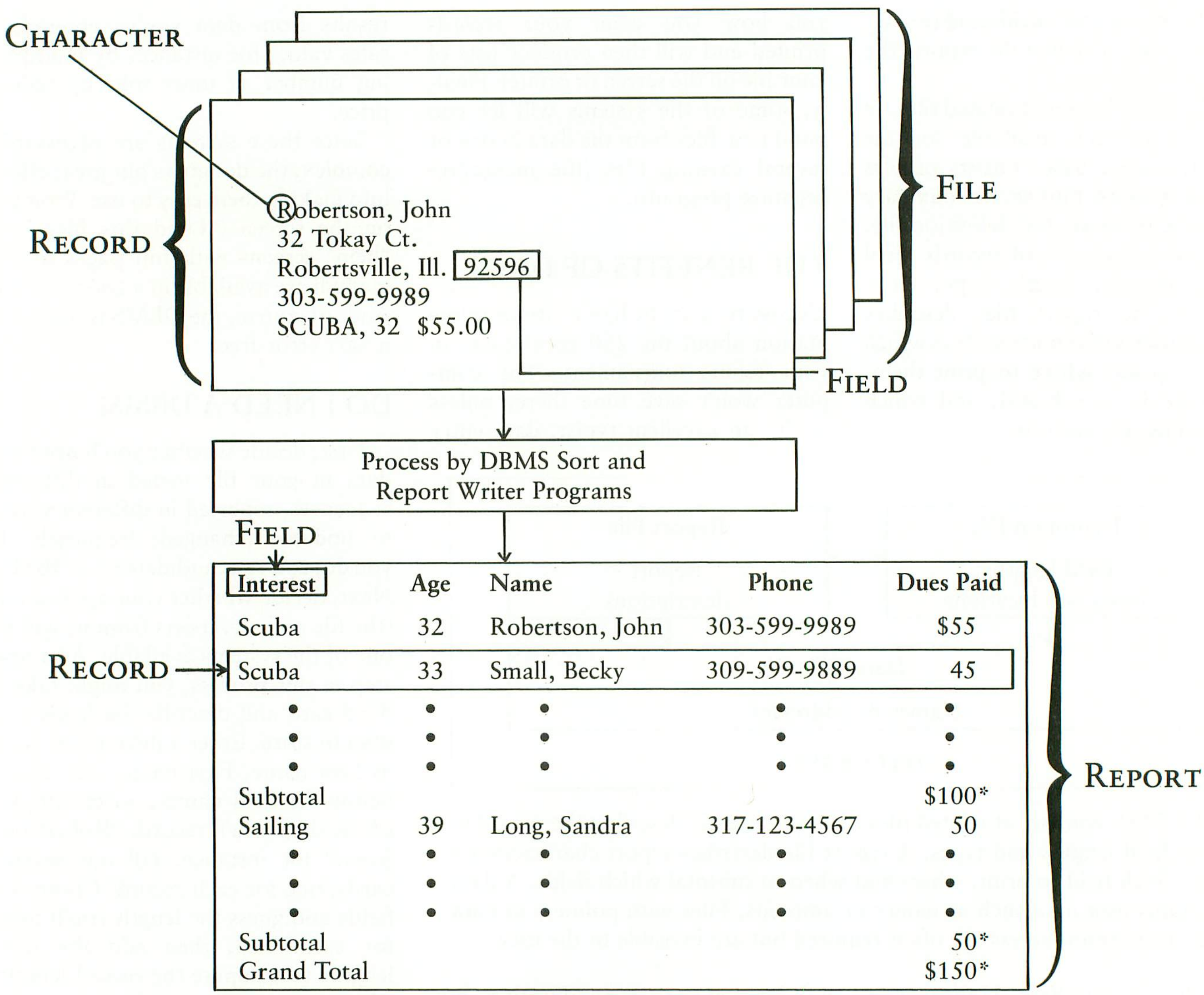
First, decide whether you'll need the data in your file sorted in different sequences, reported in different ways, or updated (changed) frequently. If you do, you're a candidate for a DBMS. Next, decide whether your application (the file and all reports from it) will fit one of the systems available. As a first step in this process, you might take a 3 × 5 card and describe the fields you plan to store. Enter a field name, such as Last name, First name, etc. Then, below the field names, write samples of the data you'll record; "Robertson, John," for instance. Fill out several cards, one for each record. Count the fields and guess the length you'll need for each field, then add the field lengths to compute the record length. Then, estimate the number of records you will use in a file. Finally, compare these numbers to the "capacity" charts in following articles. If everything fits, you may wish to examine the features and choose a specific system for your work.

HARDWARE REQUIRED

Although some systems get by on 16K of memory, you'll probably find your file size severely limited. In general, plan to have at least 40K and, even better, 48K. Get 48K for all the full-scale systems, no matter what the manufacturer says.

All the systems in our survey need at least one disk drive. Some, however, could certainly benefit from two drives — to eliminate disk swapping. Only

continued on next page



A DATA FILE may be organized in one way and reported in different orders. In this example, a name and address file with addressees' interests, age and dues paid, is organized by DBMS sort and report writer programs into a report by interest area with total dues by area. The report omits data not needed for this use. The data file could be sorted in different orders and reported in different formats.

one of the systems takes advantage of the double-density feature of Percom drives. The rest should operate with Percoms in single-density mode. Only one system now officially supports the 80-column card from BIT 3, a nice feature for this type of program. And only one system works with the RAM-DISK 128K memory card. Would you believe that each of those "one systems" is a different system?

A printer seems almost a necessity for most applications. The systems will work fine without a printer, however. If you can borrow a printer when you need one, that should be okay.

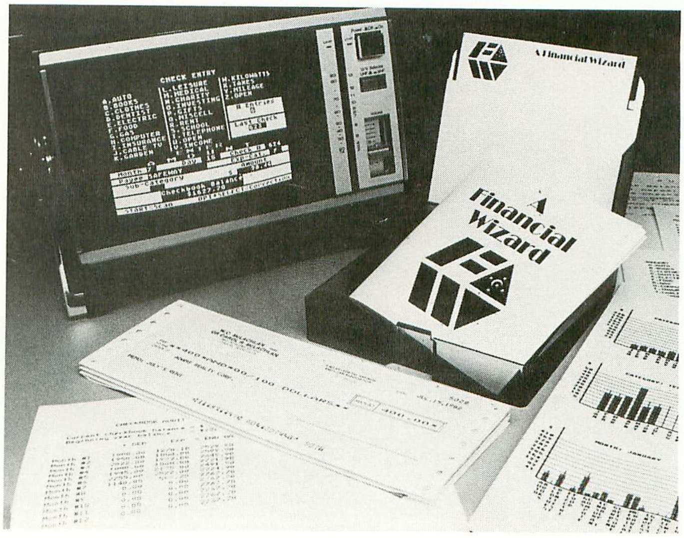
A FINAL SELECTION LIST

Murphy's Law guarantees that "whatever can go wrong, will." After watching many disasters, I'm a firm believer in seeing all parts work together before buying. A long visit to a reputable dealer who will let you test the software on your application is always a wise step. Bring your own hardware to the store, if necessary. But whatever you do, try it out yourself. The several hours you'll spend here may save hundreds of dollars spent on hardware that won't do what you need, or a program that doesn't feel right.

Ken Harms, our Contributing Editor usually responsible for PILOT articles, is Vice President of Administration for the California Division of the American Cancer Society. Familiar with large data bases and mainframe applications, he courageously waded through the enormously complex comparison of the nine DBMS products surveyed in this issue.

If you are serious about personal finance...

- **Budget Forecast** – 26 expense categories
- **Check Entry** – easy data entry – scan & modify 26 major & 36 sub-categories – information block
- **Check Search** – single or multiple parameters – (up to seven) to search entries
- **Tabulations** – detailed expense vs. budget comparisons by month, year-to-date, category
- **Bar Graphs** – screen displays in graph form expenses vs. budget – by month or category – printing with graphic capable printers
- **Check Reconciliation** – fast clearing of resident checks & deposits, complete summary report
- **Checkwriter** – prints your custom checks
- **Printouts** – most popular printers
- **Multi-Colored Graphics • Audio Enhancements**
- **7 Utility Programs • User-Friendly Operation**
- **Easy To Use Instruction Manual • Audit Report**
- **Handsome Tinted Plastic Storage Case**



COMPUTE!
The Leading Magazine Of Home, Educational, And Recreational Computing

In a feature editorial.

"If you want to use a finance system, but don't want to spend several days trying to learn how to use one, then A Financial Wizard by Computari may be just what you need."

"The illustrated manual that comes with this program is clear, direct, and very thorough."

"It appears that this finance system was designed to achieve the best and most comfortable working relationship between the user and the program."

"The check entry routine is the most attractive feature of this finance system. Data prompts are very clear and the category item names are displayed at all times during data entry for your convenience."

"The file search capabilities of this program are superior. You are offered seven ways to look up the checks."

"The system is disk intensive. All data is saved automatically and immediately following all routines that either enter data or modify it."

"Scanning your entries is made possible by pressing START. You can see records very quickly this way."

"This is an excellent finance system – entertaining, accurate, and fun to use."

ANALOG COMPUTING
THE MAGAZINE FOR ATARI COMPUTER OWNERS

Analog Magazine in a comprehensive study of personal finance systems for Atari* computers.

"A Financial Wizard from Computari is by far the best of these programs and will be the standard of comparison for the others."

"The check entry mode is easy to use..."

"The way a Financial Wizard handles your tabulations is excellent. You can chart your actual expenses vs. your budget by month, by category or year to date."

"...where it really outshines the rest is in the check reconciliation."

"In effect it gives you your bank statement on the screen, a complete list by month of all your checks and deposits."

"A Financial Wizard has one disk that does everything..."

"Graphics, while really not a factor in the quality of programs of this type, do make your budgeting chores a little more pleasant. Again A Financial Wizard comes out on top."

"Everything about this program is excellent..."

Antic
The ATARI Resource

In a Report from Antic.

"Like most Atarians, I am captivated by the graphic, color and sound capabilities of my machine. Nothing quite discourages me more than to boot up an applications program (personal, business, etc.) and to be presented with the standard graphic 'o' white characters on a blue screen.

Of course the usefulness and effectiveness of a program is of primary importance. However, enhancing the dullest of applications programs with some of Atari's charms, is a great asset. A Financial Wizard, a personal finance program by Computari's Bill McLachlan, is an excellent example of an applications program that integrates many of the Atari's features into a well conceived and executed program."

"The use of color and sound in the data input prompts and error checking routines are so well done that it's quite simple to boot up the disk, follow along with the very clear documentation, and be 'up and running' in short order."

"I give A Financial Wizard high marks in ease of use, documentation and performance. If a disk-based home finance package is in your future, The Wizard should get serious consideration."

Computari's
A Financial Wizard 1.5
The logical choice.

The system is designed for Atari computers having a minimum of 32K and operating from a disk drive. The cost is only $59.95 plus $3 for handling/postage.

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Dealer inquiries invited.

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What you get first, in the amazingly adaptable ATR8000, is plug-together interfacing to all ordinary system devices:

- To floppy disk drives — The ATR8000 lets you hook up from one to four low-cost add-on drives, 5" or 8", one- or two-sided, in any mix . . . and go right to work with either a single- or double-density DOS. (DOS is optional.)
- To a printer.— The ATR8000 parallel "Centronics-interface" is supported by a ROM driver program that you can access from Atari Basic.
- To a modem, to a serial data terminal or to any other RS-232 communicating device — The comprehensive users manual includes an Atari Basic serial printer driver.
- To Atari peripherals such as the 810 Disk Drive.

And of course the ATR8000 interfaces to the 400 or 800 computer itself.

But system versatility is just the beginning; the ATR8000 also opens the door to another world of microcomputing.

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Quite simply, CP/M is the dominant operating system of the 8-bit microworld. Make the ATR8000 your first system expansion unit, and you can put the CP/M world in your own little jug.

Since the ATR8000 is actually a self-contained Z-80 computer, a low-cost upgrade converts your Atari-ATR8000 system into a full-capability CP/M machine. Of course you can also start right off with a CP/M-ATR8000. In either case, you get CP/M program-development capability, plus access to an enormous base of proven application programs that just load and go. The CP/M upgrade, which includes 64 Kbytes of RAM, costs just $249.95.

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Like the ATR8000, CO-POWER-88 comes with comprehensive documentation. Prices begin at $749.95 with 128 Kbytes of RAM and CP/M-86 operating system.

DATA BASE SURVEY

FULL-SCALE SYSTEMS

by KEN HARMS

Full-scale Data-Base Management Systems (DBMS) are the most capable and flexible of all the systems surveyed. Generally, they have more features and are the most complex, but they are not necessarily the hardest to use. Only four systems qualified as "full-scale" products in our survey: **CCA, Data Perfect, File Fax, and FileManager +**. The best of these are excellent, and all had some excellent features.

To qualify as "full-scale," a DBMS had to handle at least 500 records of 100 characters each, allow at least 20 fields per record, and sort on at least three of those fields. These systems also generate reports designed by the user.

Although each of the four programs meets the minimum requirements, they differ considerably in ability, ease of use and features. Before buying, carefully study the charts and narrative to evaluate the strengths and weaknesses of each system.

THE EVALUATION

Each system was evaluated for over 180 characteristics, features and functions. Our comparison chart shows the most important of these. The following narrative represents my best judgement after using all the systems on several data bases. All data, and most of the judgements in the table, were discussed with each vendor, but you should verify our findings before you buy.

Comparisons of time requirements and use capacities are based on a consistent record of 100 characters containing nine fields in a 48K machine. Features common to all programs (or missing from all) are generally not included in the chart, but are covered in the narrative.

The chart presents the features roughly in the order you would encounter them as you use the system. If you purchase one of these, make sure you get a version equal to, or higher than, that shown on the chart.

continued on page 51

YOU'VE GOT FROM NOW 'TIL THE END OF THIS PAGE TO BECOME MOUNTAIN KING.

GO!

See all those glittering diamonds? Grab 'em.

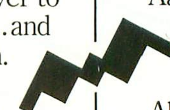
You need 1,000 diamonds fast. To score, you have to burrow deep. Deep into the caverns.

You craftily cop a dozen jewels. Then, jump to the ledge below. Then down to another. And another. But, STOP!

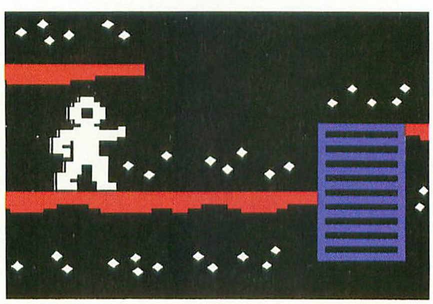
There's nothing but an abyss below. Nothing for you there except a bad fall—and even worse, delay!

No, don't go there. You've already stripped that vein of diamonds. Go where no one has ever dared venture before.

Follow the caverns. Deeper and deeper. Down the ladders. Over to the right—more jewels...and CURSES!...you've fallen. And you're losing time. Grab those diamonds.

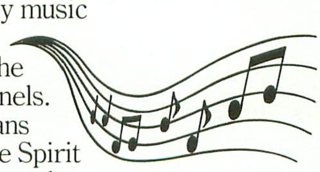


Ah ha! You've reached 1000! The Flame Spirit has been set free. Now you must capture it.



Quick—down another ladder. Listen!

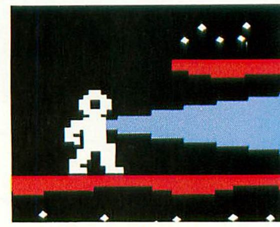
Ghostly music floating through the black tunnels. That means the Flame Spirit is hiding nearby.



The music grows louder as you draw closer.

Now softer (quick, go back the other way). Louder again. Shine your flashlight.

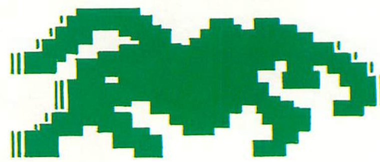
The Flame Spirit is very near. A flicker. Out of the corner of your eye. Shine that light!



There it is. Now, kneel before the Spirit and grab it. Gotcha! Run! Run to the Temple. Watch out! Behind you! A vampire bat trying to steal the Flame Spirit. Climb down, below the ledge. Another bat!

Down. To the very bottom of the mountain.

To the pit. And the darkness. Lit only by the shimmer of diamonds. Suddenly there's a rush of movement...a giant spider—after you.

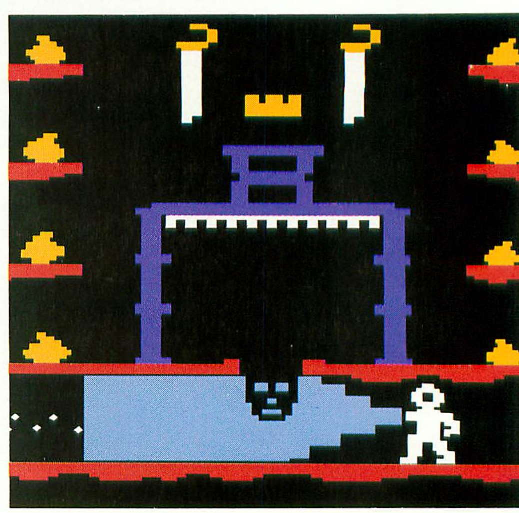


Run. Jump. Up to the ledge. Hurry! Jump again!

Aarrrrgggghhhh! You're caught. Woven in a tangled web. Hurry, break loose before he returns and you're devoured.

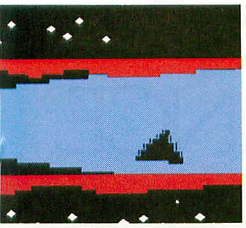
Ah! You've freed yourself. You've lost time, but you've gained character.

Now, on to the Temple. But beware of the guardian flames—one false move and you'll end up charred ...and out of the game! Get to the Temple Portal, the Spirit in your grasp. Shine your light on the giant guardian skull. You kneel. (Not out of respect, but out of need—for without



kneeling, entering the Temple is forbidden.)

The entrance yawns open. And you leap in. There, enshrined deep within the



sacred Temple, emblazoned with gold, is the sovereign crown. You must get that crown. Without it, you cannot become Mountain King. With it, you'll rule.

But now comes the tough part. Can you make the treacherous climb back to the surface? Can you avoid the relentless bats and spreading cave fires on the way? Can you even find the way?

Get Mountain King.™ Plug it into your home computer. It will plunge you into the depths, and lift you to the heights.

ANOTHER GAME TO DIG INTO.

It's Boulders and Bombs.™ One to four can play. And with 99 levels of terrific tunneling adventure, it's every bit as involving as Mountain King.

Your challenge is to tunnel to safety beneath the surface of an unknown planet as hostile, alien vultures seek to turn you into a buried fossil, entombed in an alien life form.

While day turns to night above ground, you use your trusty roto-auger to claw a path to safety below ground—through tons of earth, boulders, and the ever-spreading green cave fungus.

Fortunately, you can unearth time bombs along the way to blast away the hazards the vultures toss at you.

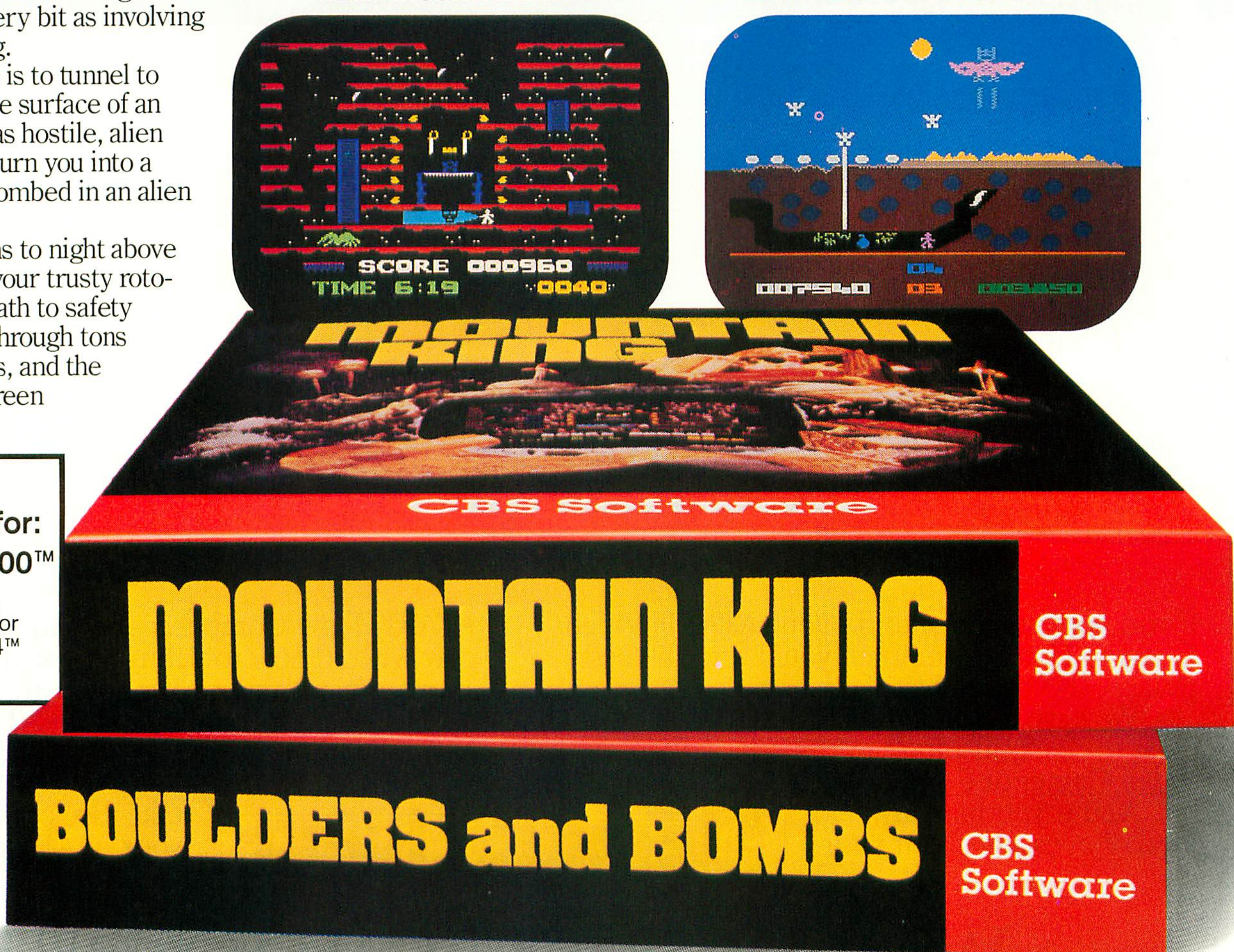
But the crawling fungus spreads as time runs out.

Now that you know the names of these challenging new games, and you know what it's like to play them, there's one other thing you should know:

They're from CBS Software. And even though that name says a lot about quality entertainment, we haven't mentioned it until now.

Because at CBS Software, we believe our computer programs should speak for themselves.

NEW! MOUNTAIN KING **NEW! BOULDERS AND BOMBS**

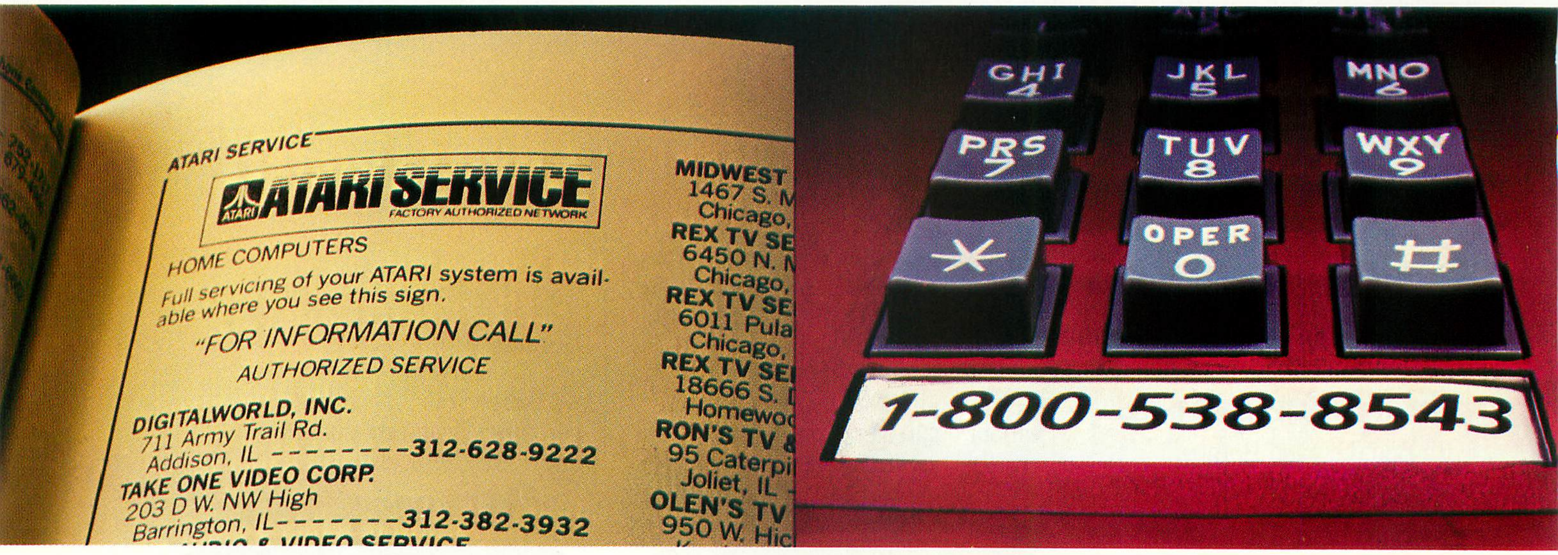


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*California: 1-800-672-1404

HARDWARE

All systems require at least one disk drive. The number of drives "supported" indicates the maximum number of drives which can be accessed during an operation. In other words, although FileManager can access files on any one of four drives at one time, only File Fax will allow records from a single data file to be entered on more than one drive.

Only four systems qualified as "full-scale" products in our survey: CCA, Data Perfect, File Fax, and FileManager+.

"Need for second drive" is a personal judgement of how difficult the DBMS is to operate with only one disk. Since CCA and FileManager load only part of the master program at a time, a single-drive user must occasionally "swap" data disk for system disk to access some functions. Although Data Perfect loads the whole program at the start, it does require two disk swaps for each record in some rarely-used operations. Both of these situations increase the need for a second disk drive.

CAPACITIES

Each system can accommodate only a certain number of fields, and no matter how few fields are used, a record cannot exceed a certain maximum length. Although every field also has a maximum length, the maximum *record length* is seldom the product of number of fields times field length.

Each product has different limitations. For instance, if you need 30 fields, only Data Perfect or File Fax will work. If, however, you need fewer, but very long fields (descriptive text, for instance), only FileManager will suit.

The number of records a system can handle in a single data base is limited by memory and disk space. The chart reports the maximum number of records for a file of 100-character records with a four-digit numeric key. Since entirely different schemes are used by each of the four systems, they will not behave comparably if the record format is changed. CCA and File Fax store keys on disk and are, therefore, insensitive to the length of the key. Data Perfect keeps all records in memory and also doesn't care what size the key field is.

FileManager keeps keys in memory, but records on disk, making it difficult to calculate a maximum file size. Once the key field becomes longer than about one 25th of the data record, FileManager becomes memory-limited very rapidly. For example, all systems were originally configured for a numeric key field. With this key, FileManager would accept only 255 records since it assumes that all numeric fields are 14 characters long. Under its scheme, a 14-digit key limits the system to 255 records no matter how short the full record is. I had to reconfigure the test data to use an alpha field four characters long to get more than 500 records with FileManager. A further warning: since FileManager sorts by changing the index fields, you may not be able to sort files on longer keys. For example, if a data base contained 400 records with a four-digit key, an alphabetic sort on last name (even limited to five characters as FileManager suggests), plus first name, would expand the index up to 10 characters. Since FileManager can only handle 319 records if the index has 10 characters, you would not be able to sort the file.

All systems require at least one disk drive.

You probably wonder how File Fax stores 1000 records of 100 characters (100K total) on a disk which stores only 88K. They "pack" data with a special encryption scheme. Very neat!

Most DBMSs generate an internal "pointer file" which tells where a particular record is located on a disk, without reading the entire file. These pointers work on "key field" (or "index field"). Access to a record is much faster using key fields, so you'll want to choose as key fields the ones you use the most; the last name, for instance, in a name and address file.

The CCA system automatically uses the physical position of the record (the record number) as its key. File Fax automatically assigns key-field status to the first field in the record. Neither of these schemes is as flexible as the Data Perfect method (allows any single field) or the FileManager approach (three fields — but limited to 24 characters). All the systems search for duplicates. A search will get the first record which matches your "call" in the key field. If two or more records match the criteria, you skip to the next record manually. (Duplicate keys are not applicable to CCA's record-number system.)

To optimize disk use, some systems permit only one data base per diskette. With backup, this costs two diskettes per data base. If you anticipate many small data bases, your disk cost would be reduced by using CCA or FileManager. Only File Fax can handle thousands of records — over 4,500 records of 100 characters! This could be crucial feature.

GENERAL INFORMATION

The first ten items in the chart make a system generally easy or hard to use. A single-load system installs the entire program into the computer when the system is started. Other systems, that do not load completely at boot, cause delays and disk swapping during operation.

A careful system will require confirmation to perform a "dangerous act." File Fax is generally very good here except that a [CONTROL] [Q] keypress will return immediately to the menu without saving keyed-in data.

continued on next page

The [ESCAPE] key also destroyed form designs without asking confirmation.

Prompts on the screen are reminders of available actions. *Help* screens show pages of explanatory text. File Fax's help screens are nicer than prompts for a new user, but an experienced user will probably prefer Data Perfect's excellent prompts.

Vendor support seems good, and all companies have full-time employees who answered my questions knowledgeably. CCA, a well-established system, is the only one I know of with an active user group. This could be important if you chose to modify the system.

Keyboard consistency means the same key always does the same thing. Data Perfect's consistency was generally very good. After I got used to its two-step method of doing some operations, the system was very logical. A system should reject unallowable keypresses — an alpha character in a numeric field, or an incorrect choice. File Fax does this very well. A system that remembers your choices reduces typing. Both Data Perfect and File Fax are excellent here.

Some people like unusual screen colors. In my opinion, blue and white is the easiest to read. I found File Fax's black and white difficult to get clear on my screen. If you like colors (and large letters mixed with small ones), you'll love FileManager. FileManager uses different colors for different sections of the program. Some may find this helpful; personally, since the screen brightness kept changing, I was annoyed. Data Perfect uses an excellent two-color scheme to separate choices and prompts from data.

Only CCA allows an experienced programmer to modify its code. This could be a real advantage for a user with specific applications. Many CCA users, for instance, have produced special reports. The BIT3 80-column card could be supported. Modifications are available to use the double-density mode on Percom drives (contact John R. Babson, 106 Berwick Dr., Pittsburgh, PA 15215). The double-density mode was not tested.

All labels from File Fax will have a computer look since it does not allow lower-case letters. Both Data Perfect and FileManager can merge data with form letters in a word processor. This is a very nice feature!

FULL-SCALE DBMS

	CCA DBMS	DATA PERFECT	FILE FAX	FILE MANAGER +
VERSION	4.1	1.3	Release 2	4D
HARDWARE				
Drives Supported	2	2	4	2
Need for second drive	High[a]	Moderate[b]	Low[b]	High[a]
Special hardware supported	Percom[c]	80-columns	None	RAMDISK
Minimum Memory	40K	32K	48K	40K
CAPACITIES (MAXIMUM)				
Number of fields	24	32	31	20
Record size (characters)	249	511	880	2000
Field size (characters)	110	127	40	100
Number of 100 character records	800[d]	696	1005[e]	512[f]*
Data bases per diskette	Many	1	1	12
Number key fields	N/A	1	1-first	3
Key field length	N/A	127	40	24
Number of data file drives	1	1	4	1
GENERAL INFORMATION				
Single Load	No	Yes	Yes	No
Confirm destructive acts	Good	Excellent	Fair[g]	Fair
Prompts	Good	Excellent	See help	Poor
Help screens	No	No	Many	No
Vendor support	Good*	Good	Good	Good
Keyboard consistency	Good	Good[h]	Good[g]	Excellent[i]
Unallowable key rejection	Good[j]	Good[j]	Excellent[k]	Good[j]
Retains user choices	Seldom	Often	Often	Seldom
Screen colors	Blue	2-color	Black	Various
User Modifications	Yes-Easy	No	No	No
Lower case	Yes	Yes	No	Yes
Merge w/word processor	?	Letter Perfect	Not Now	Text Wizzard
DOCUMENTATION				
Tutorial	Advanced*	Yes	Yes[l]	Fair*
Index	Partly	Fair	No	No
Presentation	Fair	Poor	Excellent	Poor
DATA BASE DEFINITION				
Full Screen Layout	No	Yes	Yes	No
Easy re-editing	No	Yes*	Yes	Yes
Build new specifications from prior	No	Easy	Easy	No
Print out file definitions	Yes	Yes	Yes	No
Reorganize data base	None	Excellent[m]	None	Good*

See page 94 for chart notations

DOCUMENTATION

Unfortunately, while most of the products show a lot of thought, only File Fax includes a good manual — and even that does not include an index!

FULL-SCALE DBMS

	CCA DBMS	DATA PERFECT	FILE FAX	FILE MANAGER +
VERSION	4.1	1.3	Release 2	4D
FIELD TYPES				
Decimal positions	Yes	Yes	No*	No*
Constants	No[n]	Yes	No*	Yes
Require field fill	No	No	Yes	No
Automatic Dollars and Cents	No[o]	No[o]	Yes	Yes
Date	No	Yes	No	No
Non-editable	Yes	No	No	No
# Computed Fields	Any[p]	16	None	5
Complex Math on Computed Fields	No	Yes	No	Yes
Auto Incrementing	No	Yes	No	No
DATA ENTRY / UPDATE				
Full Screen Form	No	Yes	Yes	No
Atari Editing	No	Yes	Yes	Yes
Special Editing Functions	None	Excellent	Excellent	Non
Excess Field Length Warning	Yes	No	Yes	No
Auto Next Field	No	No	Yes	No
Auto Next Form	Yes	No*	Yes	No
Verify record	No	Yes	Yes	Yes
Keep data from prior record	No	Full record	By field[q]	By field[r]
Input Editing Ease	Fair	Excellent	Excellent	Excellent
Prompts / help	Prompts	Prompts	Help screen	None
Math calculation	No	Yes	No	Yes
REVIEWING / UPDATING RECORDS				
Review by how many fields	1	4 + key	All	4 + key
Review by range	No	Yes	Yes	Yes
Review by record number	Yes	Yes	No	No
Logical searches (and, or, not)	No	And / Or	And	And, Not
Wild Cards, part of field	None	Excellent[s]	Excellent[s]	Good[t]
See prior record	No	Yes[u]	Yes[u]	No
Print reviewed record	No	Yes	Yes	Yes
One-pass find & update	No[v]	Yes	No[v]	Yes
Find and change	No	Yes	No	Yes
Selective global change	No	Yes	No	No
Selective global delete	No	Yes	No	No
Search 50 records by key field	2-3 sec.	Instant	2-3 sec.	2-3 sec.
Search by non-key field (per record	½ sec.	Instant	½ sec.	1 sec.

See page 94 for chart notations

CCA's presentation is aimed at readers very familiar with DOS and computer lingo. FileManager's entire manual is tutorial that does not give enough information about what's happening unless you are actually doing their example on the computer.

Although Data Perfect is a friendly program, the manual is very hostile. If you use standard English, you'll be offended by silly errors, poor sentence construction, and confusing word choice.

DATA BASE DEFINITION

To define a data base, give it a name and then describe each of the fields in its data records. CCA and FileManager ask for definitions one line at a time. Essentially, they prompt you to name fields and set field lengths, one after the other, down the screen.

Data Perfect and File Fax, on the other hand, lay out a form on a full screen. Each field is placed where you want it and the length and characteristics of the field are displayed as they would be on a paper form. File Fax allows field names or any other descriptive data to be placed above, below, before or after the field. Data Perfect requires the exact field name immediately before the field. Although both systems are very good, I prefer the flexibility of File Fax's layouts. These layouts can be edited. Data Perfect allows you to insert a new field anywhere in the layout, but when you want to enter data, you must work on the inserted fields after completing the original fields.

If your application requires a lot of complex data entry, File Fax's outstanding screen would be very useful. An easy system should permit you to build a new data definition by modifying a prior one. Two of these DBMSs allow this.

Finally, you will probably want the ability to reorganize an existing data file into a new file by adding, deleting or rearranging fields. Only Data Perfect and FileManager allow you do do this automatically — with the others you must retype the data.

Data Perfect reorganizes files one record at a time. This is all right if you have two drives, but with a single drive you must swap disks twice for each record — an intolerable inconvenience!

Data Perfect will merge files created under the Letter Perfect word-process-

continued on next page

ing program, or Atari DOS files created by BASIC programs. The manual doesn't describe this adequately, however.

Overall, File Fax's data definition is outstanding. However, lack of a "reorganize" function severely limits overall flexibility. Data Perfect's definition screen is also very well done, but you'll need access to a second drive to use the reorganize function easily.

FIELD TYPES

All systems allow alphabetic and numeric fields. In the chart, "decimal positions" specify exactly how many decimal places a number will have. File Fax and FileManager do not provide this feature, but allow automatic dollars and cents fields specified to two places. With CCA and Data Perfect, decimal placement is fully variable.

Constant fields always contain the same data until specifically changed, for example, state names, in a list predominantly for a single state. File Fax doesn't provide this on a field-by-field basis, but, on a data-base-wide level it allows you to recall data from a prior record by a blank return. A "require field fill" does not allow blanks — what does one do with a 6-digit telephone number, for instance?

A date field holds MM-DD-YY numbers and sets up sorts so that 12-01-82 is less than 1-1-83, very useful if you plan to sort by birthdays. It also prohibits month 13, etc. A non-editable field does not allow update — whatever is entered first remains forever.

Computed fields automatically calculate results from values entered into other fields in the same record. For instance, if you entered "units sold" and "price per unit," a computed field could show the total sale. This is a very powerful feature. Data Perfect carried it one step further to allow access to the internal record number. This lets you automatically increment a field value for each record — check numbers could be calculated automatically, for example.

File Fax presents nice prompts for field attributes and has some unusual field types such as right justified, Y/N, and alpha-only. Overall, however, lack of computed fields will probably limit File Fax's usefulness for many applications.

Computed fields automatically calculate results from values entered into other fields in the same record.

DATA ENTRY/UPDATE

One major purpose of a DBMS is to enter and update data at will. All these systems do this, but some are considerably easier and faster than others.

The nicest screens for data entry are by Data Perfect and File Fax, both paper-like forms. These screens use the ATARI editing features such as up, down, insert and delete. File Fax presents a more creative form and is the easiest to use.

CCA and FileManager show data-entry screens as a list of fields. Both allow insert, delete, and right and left arrows for editing within a field. FileManager allows up and down arrows to edit different fields. CCA allows "going back" to edit a field, but you must retype the data in that field.

Several special editing functions in Data Perfect and File Fax automatically enter parts of a field without retyping the entire field. Both Data Perfect and FileManager allow entry of data beyond the limit of an alphabetic field, but truncate the input without warning.

The *auto-next-field* feature moves the cursor to the next field when the current field is full without requiring a return. This speeds data entry for fields such as phone numbers, zip codes, etc. *Automatic-next-form* saves the record and brings up a new form when the last field is completed. Data Perfect doesn't do this because it allows the user to choose whether the next form will be blank or will include data from the previous form. File Fax can remember data from a prior record on a field-by-field basis, which is helpful on many applications.

We have seen File Fax's generally logical presentation, and data entry is no exception. The designers have, however, made several unfortunate decisions by locating editing choices in the data-definition module rather than in entry/update. For instance, you generally would choose to "verify record before input" to be sure you were familiar with a new form. After entering a few records, you would often like to change to auto-next-form. Doing so with File Fax is a frustrating procedure.

The math-calculation feature allows you to see results of computed fields before saving the record.

Some of the systems incorporate all the desirable features (see chart), but File Fax's outstanding screen makes it more efficient for large-scale data entry operations. Data Perfect, a close second in screen quality, will be better for records which are very similar from one record to the next. FileManager's record-saving routine is extremely slow and would handicap users with large numbers of records.

REVIEWING/UPDATING

After entering data, you'll want to find particular records and either read ("review") or change ("update") them. You specify what you want, and the program searches for that information. CCA does this for only one field at a time. Other systems permit specifying a range of values for several fields. Some systems find records by record number. This is handy when you compare records to the "hard copy."

If you specify multiple criteria, the programs require that the record satisfy all criteria. This is an AND search ("Both field 1 AND field 2"). FileManager allows NOT searching ("Do NOT select if age is less than 26"). Wild cards allow you to specify parts

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DATA BASE SURVEY

SMALL-SCALE SYSTEMS

by KEN HARMS

Five data base management systems for the ATARI don't permit large numbers of fields or are otherwise more limited than the full-scale DBMSs reviewed elsewhere. Formerly, the smaller programs were considered easier to use. However, outstanding large-scale systems have erased that advantage and left only two significant niches for the small programs — price and special applications.

The small systems deliver on price, running from $23 to $50, compared to at least $100 for their bigger sisters. Although most of these systems are designed to accept nearly all kinds of data, Atari's **Home Filing Manager** is a very simple system which handles very simple data very well indeed. Needing only 16K of memory, it's an outstanding example of a beautiful, friendly program to fill a specific need — in this case, the automated card file.

You should go through the normal steps of designing a few data bases on paper (see article on full-scale systems) to see whether a limited system will fit your needs. If you're looking primarily for labels, also consider the mailing list products not surveyed here.

The comparison chart for the small-scale systems includes only the most important variables. The text covers most of the unusual features and specific faults of each program. Terms not defined in this article are explained in the "full-scale" article.

HARDWARE

Although some systems claim to run in small memory spaces, they won't hold very many records unless a full 48K RAM is available. The exception is Home File Manager, which stores only keys in memory and isn't quite so memory-bound. The need for a second disk drive increases as the need to swap diskettes increases. **MMG, File It** and **APX20134** require you to load data after changing sections of the program. This is a bother in its own right, and is even worse if you must constantly switch diskettes in a single-

continued on page 96

MEET THE NEW KID ON THE BLOCK.

Catch-up with the newest, wackiest video game you've ever played! Kid Grid! But don't get caught with your guard down because the mischievous bullies Squashface, Thuggy, Muggy and Moose are after you in hot pursuit.

It's the wildest, fastest chase you've ever been in. You've got to connect all the dots on your grid: keep on the look-out for the mysterious bouncing question mark and don't slow down at corners! Squashface, Thuggy, Muggy and Moose are always on your shirttails. Your secret weapon—the joystick button. Press it and the bullies get zapped! When they turn white and freeze, make your escape. If the bullies finally catch you the results are explosive!

With Kid Grid you get all the sights, sounds and colors of arcade games. The better you get the faster and wackier Kid Grid becomes. Soon you'll be racing around at hyper-space speeds!

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Dealer inquiries invited.



TRONIX

Lone Eagle's Revenge

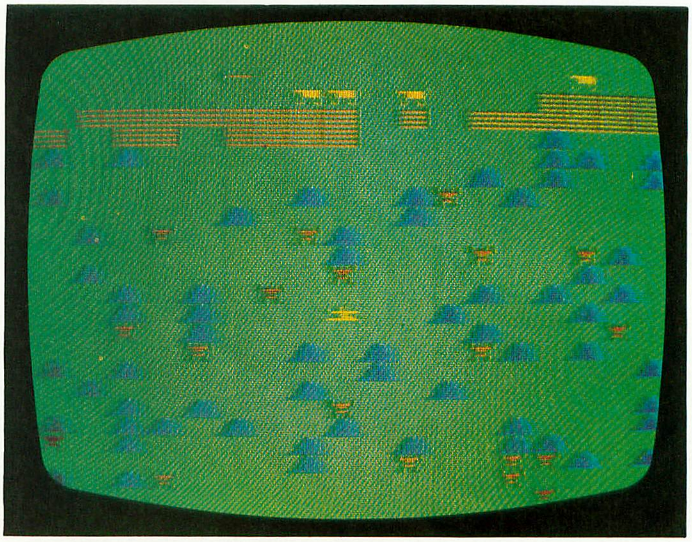
by JOHN WEBER

Lone Eagle has five horses, and keeps them behind a fence. Outside, the woods are full of bears that sneak up to eat the horses. The object of the game is to protect your horses from the bears.

As the game begins, one bear will start to move towards the horses' enclosure. If it reaches the fence, the bear eats a horse. When all the horses are lost, the game is over.

To protect his horses, Lone Eagle can either wound the bears, stopping them temporarily, or kill them. Lone Eagle moves around in response to the joystick. To wound a bear he just moves to the spot which the bear occupies. The bear will vanish and reappear elsewhere on the screen, usually near the bottom. To kill a bear, he must use bow and arrow. The bow will shoot in one direction only, towards the left. To fire, press the joystick to the left and simultaneously press the fire button. Lone Eagle can only carry ten arrows at a time. To restock, he must move to the arrow symbol in the area behind the fence. Placing Lone Eagle next to it will supply him with his limit of ten arrows. This can be done at any time during game play.

The bears move faster as more of them are killed, but only one will attack your horses at any time. If a bear is moving along either side of the screen and finds its way blocked by a boulder, it may sneak around to the other side of the screen. Lone Eagle can also "wrap around" like this. Also, if a bear gets trapped between the rocks, he can no longer attack. Once a bear knocks down part of the fence or goes beyond the fence line, he will no longer attack. At



this point, a final screen will appear notifying you of Lone Eagle's statistics.

1. How many horses were lost.
2. How many bears were wounded.
3. How many bears were killed.
4. How many arrows were fired.
5. Percentage of arrows fired and bears killed.

Now you can press START to play again or SYSTEM RESET to end.

```
100 GOSUB 1000
105 DIM C(20),K(20),H(6)
150 POKE 756,CHSET/256:SETCOLOR 4,12,4:P
    OKE 710,35:POKE 709,42:POKE 711,8
160 SC=PEEK(88)+256*PEEK(89)
170 POS=SC+249:DEAD=1:E=1:HARD=9:KILL=0
    :WOUND=0:LIMIT=5:FIRE=0:SHOT=0:X=0
185 FOR I=1 TO 20:K(I)=1
190 C(I)=SC+INT
    (349*RND(0))+125:IF C(I)=POS THEN 190
195 IF PEEK(C(I)) THEN 190
200 POKE C(I),4+128:NEXT I:D=C(1)
205 FOR I=1 TO 40*RND(0)+30
210 XS=SC+INT(349*RND(0))+75
215 IF PEEK(XS) OR XS=POS THEN 210
217 IF PEEK(XS)=132 THEN 210
220 POKE XS,5+192:NEXT I
225 FOR I=1 TO 60
230 XS=SC+INT(35*RND(0))+35:POKE XS,7+12
    8:NEXT I
235 FOR I=1 TO 5
236 DJD=SC+INT(25*RND(0))+15:FOR I1=1 TO
    I:IF H(I1)=DJD THEN POP :GOTO 236
237 NEXT I1
238 H(I)=DJD:POKE H(I),9+64:NEXT I
240 XS=SC+INT(5*RND(0))+5:IF PEEK(XS)=19
    9 THEN 240
241 POKE XS,8+128
300 ST=STICK(0):POKE POS,6+64
310 IF INT(RND(1)*10)+1>HARD THEN GOSUB
    400
315 IF ST=15 THEN 300
316 IF KILL=4 THEN HARD=8
317 IF KILL=10 THEN HARD=7:GOSUB 600
320 IF STRIG(0)=0 THEN GOSUB 800
```

continued on page 59



NOBODY EVER PLAYS JUST ONE HAND OF STRIP POKER.

There's no such thing as a quick game of *Strip Poker.* With two captivating female opponents, this fast-paced program features graphics and game play so realistic that players tend to lose track of time. Decorum forbids that we actually show you what happens on the screen. Suffice it to say that our sophisticated software gives you ample incentive to stretch your poker skills to the limit!

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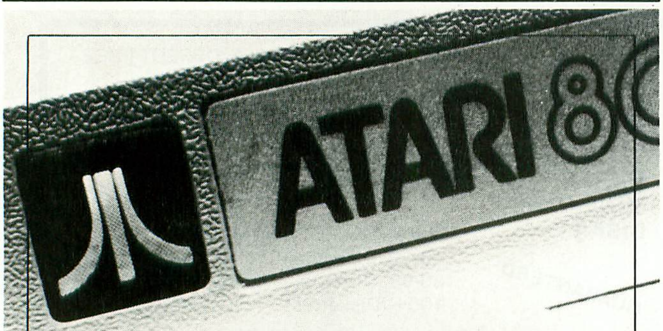
So you can play.

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LONE EAGLE'S REVENGE *continued from page 57*

```
325 NPOS=POS+20*(ST=9 OR ST=5 OR ST=13)-
    20*(ST=6 OR ST=10 OR ST=14)-(ST>8 AND
    ST<12)+(ST>4 AND ST<8)
330 IF NPOS<SC OR NPOS>SC+479 THEN 300
335 P=PEEK(NPOS)
340 IF P=0 THEN POKE POS,0:POKE 53760,100:
    POKE 53761,136:POS=NPOS:POKE 53760,0:
    POKE 53761,0:GOTO 300
341 IF P=136 THEN SHOT=0:GOTO 300
345 IF P<>132 THEN 300
350 IF P=132 THEN POKE POS,0:POS=NPOS
356 POKE 53761,168:FOR S=26 TO 104 STEP 4:
    POKE 53760,S:NEXT S:POKE 53760,0:POKE
    53761,0
358 IF POS=D THEN GOSUB 710:E=E+1:GOSUB
    460:D=C(E):GOTO 385
359 FOR B=1 TO 20
360 IF POS=C(B) THEN GOSUB 700:GOTO 385
365 NEXT B
385 WOUND=WOUND+1:GOTO 300
399 REM MOVE BEARS
400 GOSUB 460
410 P=PEEK(D-20)
413 IF P=132 THEN GOSUB 660:GOTO 430
414 IF P=73 THEN GOSUB 500:K(E)=0:GOTO 4
    50
415 IF P=135 THEN GOSUB 500:GOSUB 430:GO
    TO 450
421 IF P=197 THEN GOSUB 660
430 D=D-20:IF D<SC+20 THEN K(E)=0:GOSUB
    500:RETURN
435 POKE D+20,0:POKE D,4+128:RETURN
450 E=E+1:IF E>20 THEN 400
455 D=C(E):RETURN
460 Y=0
461 IF E>20 THEN E=1
463 X=X+1:IF X>20 THEN 470
464 IF K(E)=0 THEN E=E+1:Y=1:GOTO 461
466 IF Y=1 THEN D=C(E)
468 X=0:RETURN
470 SOUND 0,0,0,0:SOUND 1,0,0,0:GOTO 3000
499 REM BEAR   HIT FENCE
500 POKE 53761,140:FOR S=26 TO 86 STEP 15:
    POKE 53760,S:FOR W=1 TO 20:NEXT W:NEX
    T S:POKE 53760,0:POKE 53761,0
510 POKE H(DEAD),0:H(DEAD)=0:
    DEAD=DEAD+1:IF DEAD>LIMIT THEN 3000
520 K(E)=0:RETURN
599 REM FIND WHOS ALIVE
600 IF I=7 THEN RETURN
604 DJD=SC+INT(25*RND(0))+15:FOR I1=1
    TO 5:IF H(I1)=DJD THEN POP :GOTO 604
```

continued on next page



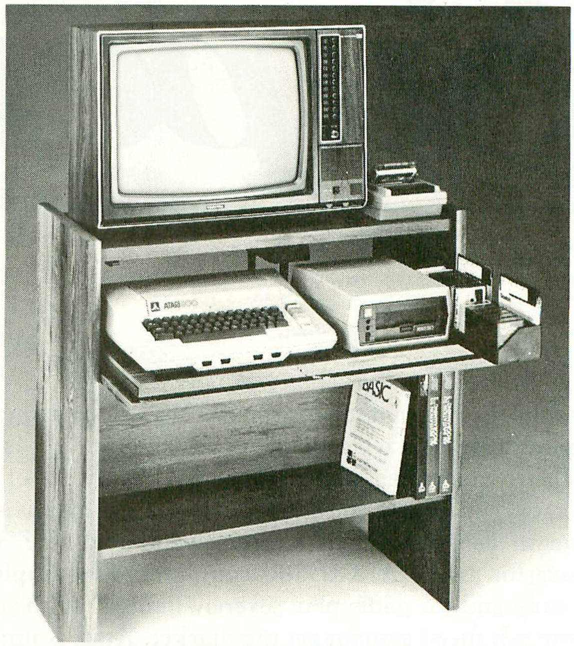

```
605 NEXT I1
610 H(6)=DJD:POKE H(6),9+64:LIMIT=LIMIT+
  1:I=7:RETURN
660 REM
662 P=PEEK(D+1):IF P<>197 THEN D=D+1:GO
  TO 668
664 P=PEEK(D-1):IF P<>197 THEN D=D-1:GO
  TO 667
666 D=C(E):E=E+1:GOTO 670
667 POKE D+1,0:POKE D,4+128:GOTO 670
668 POKE D-1,0:POKE D,4+128
670 RETURN
699 REM CREATE NEW PLACE FOR BEAR
700 C(B)=SC+INT(349*RND(0))+250:IF PEEK(
  C(B))=197 THEN 700
705 RETURN
710 C(E)=SC+INT(349*RND(0))+250:IF PEEK
  (C(E))=197 THEN 710
711 RETURN
799 REM FIRE
800 IF SHOT>10 THEN FOR A=50 TO 80:SOUND
  0,A,10,10:NEXT A:GOTO 850
803 SHOT=SHOT+1:FOR A=1 TO 3:P=PEEK(POS
  -A)
805 IF P=197 THEN SOUND 0,26,10,15:POKE PO
  S-A,5+192:GOTO 850
806 IF P=135 THEN SOUND 0,50,10,15:GOTO 8
  40
810 IF P<>132 THEN 840
812 IF POS-A=D THEN K(E)=0:GOTO 825
815 FOR B=1 TO 20:IF POS-A=C(B) THEN K(B
  )=0:GOTO 825
820 NEXT B
825 FOR S=26 TO 255 STEP 65:SOUND 0,S,8,
  6:SOUND 1,S/4,8,6:NEXT S:KILL=KILL+1
830 IF B=E OR POS-A=D THEN E=E+1:
  GOSUB 460:D=C(E):GOTO 845
840 POKE POS-A,8+128:FOR B=1 TO 15:NEXT B
845 POKE POS-A,0:NEXT A
850 SOUND 0,0,0,0:SOUND 1,0,
  0,0:FIRE=FIRE+1:RETURN
1000 GRAPHICS 17:COLOR 1:? #6;
1002 POSITION 0,2:? #6;"L O N E
  E A G L E ' S  R E V E N G E":POSITION
  3,5:? #6;"BY JOHN WEBER"
1003 POSITION 8,7:? #6;"1982"
1004 SOUND 0,200,6,15:FOR A=1 TO 6:NEXT A:
  SOUND 0,0,0,0
1005 IF PEEK(53279)=6 THEN 1099
1006 FOR A=1 TO 4:FOR B=12 TO 4 STEP -0.36:
  SOUND 0,200,6,B:NEXT B:NEXT A:SOUND
  0,0,0,0:FOR B=1 TO 10:NEXT B
1008 POSITION 5,14:? #6;"P R E S S
  S T A R T"
1010 IF PEEK(53279)<>6 THEN 1004
1099 GRAPHICS 1+16
2000 REM SET UP CHARACTERS
2005 POKE 77,0
2010 CHSET=(PEEK(106)-8)*256:FOR I=0 TO 7
  :POKE CHSET+I,0:NEXT I:RESTORE 2030
2015 READ A:IF A=-1 THEN RETURN
```

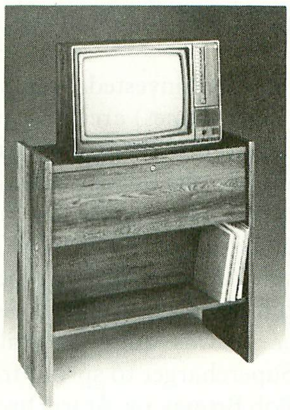
```
2020 FOR I=0 TO 7:READ B:POKE CHSET+A*8+I,
     B:NEXT I
2025 GOTO 2015
2030 DATA 4,66,90,126,60,24,60,36,102
2035 DATA 5,8,28,28,62,62,62,126,255
2040 DATA 6,4,24,152,127,28,30,255,1
2045 DATA 7,1,255,1,255,1,255,1,255
2050 DATA 8,0,64,128,255,128,64,0,0
2055 DATA 9,1,254,190,190,34,34,102,0
2060 DATA -1,-1
3000 POKE 53248,0:POKE 53249,0
3005 GRAPHICS 17:COLOR 1
3010 ? #6;:POSITION 1,1
3011 IF X>20 THEN ? #6;"Y O U  G O T
     T H E M  A L L":GOTO 3014
3012 ? #6;"A L L  H O R S E S  A R E
     L O S T"
3014 POSITION 2,3:? #6;"HORSES LOST  ";
     DEAD-1:POSITION 2,5
3015 ? #6;"NO. WOUNDED  ";WOUND:POSITIO
     N 2,7:? #6;"NO KILLED    ";KILL:POSITI
     ON 2,9:? #6;"ARROWS FIRED ";FIRE
3018 IF KILL=0 AND FIRE=0 THEN 3021
3020 POSITION 2,11:? #6;"
     % KILL/FIRE  ";INT
     (KILL/FIRE*100)
3021 SOUND 0,200,6,15:FOR A=1 TO 6:NEXT A:
     SOUND 0,0,0,0
3022 FOR A=1 TO 4:FOR B=12 TO 4 STEP -0.36:
     SOUND 0,200,6,B:NEXT
     B:NEXT A:SOUND 0,
     0,0,0
3023 IF PEEK(53279)=6 THEN GOSUB 1099:GOTO
     150
3024 FOR A=1 TO 4:NEXT A
3025 POSITION 4,14:? #6;"              "
3030 FOR A=1 TO 2:NEXT A:POSITION 4,14:? #
     6;"P R E S S  S T A R T"
3035 IF PEEK(53279)=6 THEN GOSUB 1099:GOTO
     150
3040 GOTO 3021
```

TYPO TABLE

Variable checksum = 607358

Line num range			Code	Length
100	-	205	WS	521
210	-	241	LB	429
300	-	341	ZI	532
345	-	413	SR	392
414	-	466	GP	434
468	-	610	EE	531
660	-	711	LW	435
799	-	825	VI	513
830	-	1005	UT	517
1006	-	2035	PQ	523
2040	-	3015	NZ	526
3018	-	3030	FE	500
3035	-	3040	UJ	57





Supercharger

by DAN GUTMAN

Despite the fact that the Atari 2600 VCS video game system resides in at least ten million American homes, it is truly a pathetic machine. Boasting just 128 bytes of RAM memory, it is one-third as powerful as Intellivision, a seventh as powerful as ColecoVision, and one 37th as powerful as the ATARI 800 computer. The graphics are chunky and the game play severely limited. With so many more advanced systems on the market, Atari is now practically giving the VCS away at $90, one-half its original price.

However, the players who have invested over $200 in game cartridges (that's just eight games) aren't so quick to store the VCS in the basement yet. Video game designers, with an eye on those millions of units out there, have been forced to use their ingenuity to squeeze every last ounce of memory and graphic capability out of the Atari VCS.

The most important result of this effort has been the Supercharger, a product from Starpath (formerly Arcadia) of Santa Clara, California. It was quite natural for a memory enhancer like the Supercharger to sprout from the Atari — its inventors were Bob Brown, ex-Atari Director of Research, and Craig Nelson, ex-Atari development engineer.

This is the logic they were working with: Video games are usually on ROM cartridges. So every time you want to play a different game you have to plug in a new cartridge. The only difference between each of these cartridges is the program — the plastic case, the circuit board and ROM chips are the same. These redundancies add to the cost of the cartridge, which can only hold small amounts of data anyway. How do you bring down the price of individual games and fit more memory on them?

The ROM memory of a cartridge cannot be changed. The *RAM* memory of the Supercharger *can*. The Supercharger acts as a memory buffer, accepting data from inexpensive magnetic tape. So we can have games that cost $15, compared to about $30 for cartridges. And since the Supercharger has 6,272 bytes of RAM, compared to just 128 on the VCS, vivid high-resolution graphics and lengthened playing time are possible. Both problems are solved.

The Supercharger looks like an elongated cartridge and it plugs into the cartridge slot on the VCS. A cable runs from the Supercharger to any standard audio cassette player. You simply pop a Starpath game into your cassette, hit the play button and 30 seconds later your game has "moved into" the Supercharger, which shoots it through the Atari wiring onto your television screen. The Supercharger sells for $44.95, including *Phaser Patrol*, a *Star Raiders*-like space game.

Video game designers, with an eye on those millions of units out there, have been forced to use their ingenuity to squeeze every last ounce of memory and graphic capability out of the Atari VCS.

Amazingly, the software manufacturers that rushed to make games for the VCS two years ago have not issued a single game for the Supercharger yet — they are waiting for it to enter a significant number of homes. Video game designers may be chomping at the bit to work with those 6,000 bytes, but they must wait until it's economically feasible.

Starpath, in addition to *Phaser Patrol*, has six other games for the Supercharger. Though none of them have been blockbusters, most of the Starpath games are quite good. Most observers in the games field feel that, as with the VCS, it will take a few years for designers to use the Supercharger to its fullest potential. Right now we have . . .

Communist Mutants From Space — Starpath's biggest hit, at least partially because of that great title. Programmed by 19-year-old Steve Landrum, this *Galaxian*-like contest features shields, slow motion, penetrating missiles and guided missiles.

continued on page 65



RESTON CAN HELP MAKE YOUR COMPUTER FLY.

These three easy-to-read books from Reston can help turn any beginner into a creative programmer. You can learn how to play music, create colorful moving pictures and whiz through math problems—quickly and easily. **Atari™PILOT for Beginners,** by Jim Conlan and Tracy Deliman, introduces you to the new PILOT computer language, designed to do important things quickly, with fewer commands. **Atari™ PILOT Activities and Games,** by Herb Kohl, Ted Kahn, and Dale Disharoon, takes you up into the world of advanced PILOT programming. And **Atari™Games and Recreation,** by Herb Kohl, Ted Kahn, and Len Lindsay with Pat Cleland, will have you programming your own games instead of just playing someone else's. With Reston, you can rocket right to the top.

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SUPERCHARGER *continued from page 62*

Fireball — Similar to *Breakout*, but you can juggle up to six balls at once.

Suicide Mission — *Asteroids*, under the guise of fighting "deadly killer viruses."

Killer Satellites — Horizontally-scrolling shoot 'em up. Monitor your temperature and fuel gauges, watch your radar and by all means avoid those meteor showers.

Dragonstomper and *Escape From the Mindmaster* — The first "Multi Load" games. Since Starpath games are on tape, they can be loaded sequentially — two or more related games on one cassette, similar to chapters in a book. Multi Load is to video games what the LP record was to 45's. *Mindmaster* and *Dragonstomper* (also by Landrum) are complex role-playing adventure games that contain more data than 16K computer games.

Starpath will issue three more games this summer: a sports game, a party game and "one that has rabbits in it," according to a company spokesperson. Games for the ATARI 400/800/1200 and other home computers are in the cards also. Some of these will be translations of games for the Supercharger.

There is some evidence that players may be starting to give up their "first generation" Atari VCS's to buy the "third generation" ColecoVision, or Atari 5200.

Starpath isn't the only company in the VCS-enhancement business. In June, Amiga unveils its The Power Module, which will cost $45 (along with *3-D Ghost Attack* and *Depth Charge*). Amiga's device, like the Supercharger, has six Kbytes of RAM (most cartridges have two or four of ROM). Amiga's games are also on tape and will sell for just $10. The first batch will be *S.A.C. Alert, Strafe, 3-D Havoc* and *Scavenger Hunt*. According to Amiga, in addition to 3-D games (red-green glasses come with the unit), players will be able to interface two Power Modules with a modem and play the same game thousands of miles away from each other.

There is some evidence that players may be starting to give up their "first generation" Atari VCS's to buy the "third generation" ColecoVision, or Atari 5200. Of course, if the Atari VCS dies, so do the Supercharger and The Power Module. Starpath and Amiga could very well introduce products that will juice up the third generation game systems, but they'd better hurry — Coleco itself is about to release their "Super Game" unit, a $125 ColecoVision attachment that will accept game "wafers" containing *one million* bits of information!

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Role-playing games are a serious business. They require thought and strategy, skill and luck. But the programmers of computer role-playing games haven't taken them seriously enough. Until now. Now **ScreenPlay™** does role-playing right — the Warrior of RAS™ series.

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STOCK UTILITY
(utility)
Janpro Products
P.O. Box 1028
Ontario, CA 91762
(714) 983-3817
16K — Cassette
24K — Diskette
$19.95

This program plots stock prices or other values entered into a vertical line chart. You can make hard copies of a stock at regular intervals (weekly, monthly) and can tape them side by side to form an endless chart — useful in tracking a stock. It has a chart range of 11.5 points or $11.50 with ½ point (50¢) increments.

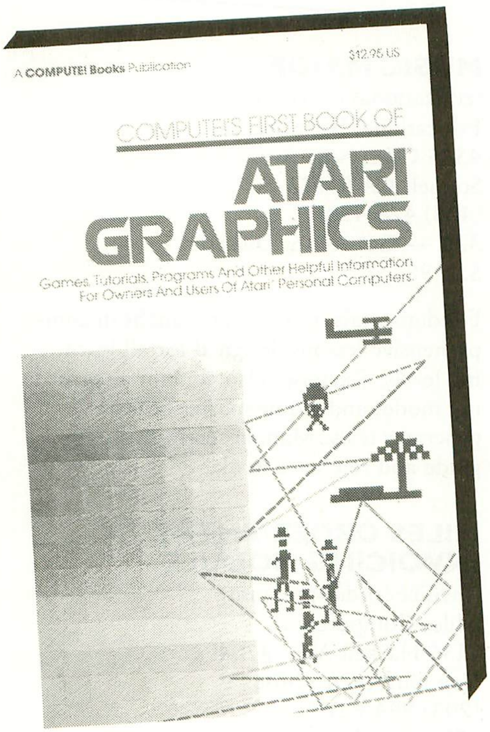
HYPERCARTRIDGE
(hardware)
Chameleon Computing
Aardvark Enterprises, Inc.
Service Center Box 119
Dickinson College
Carlisle, PA 17013
(717) 245-1717
$39.00

Hobbyists with suitable EPROM equipment can make ROM cartridges at home with this 16K cartridge. Comes with four low-profile sockets for 24-pin ROMs or EPROMs (chips not included). Two configurations possible: (1) with any combination of 2532 EPROMs and 2332 ROMs, or (2) with two ATARI ROM's and two 2532 EPROMS or 2332 ROMs.

CRISIS MOUNTAIN
(game)
Synergistic Software
830 North Riverside Dr., Suite 201
Renton, WA 98055
(800) 426-6505
40K — Diskette
$34.95

Arcade game mirrors life, as terrorist plants nuclear bomb in active volcano. Players attempt to defuse it. Levels include such obstacles as boulders, lava, and a radioactive bat.

COMPUTE'S FIRST BOOK OF ATARI GRAPHICS
(book)
COMPUTE! Books
P.O. Box 5406
Greensboro, NC 27403
$12.95



Few computers on the market match ATARI's graphic capabilities and this book highlights original as well as published material for the ATARI user. Tutorials for the beginner and programs for the advanced make this a well-balanced publication for any ATARI owner.

ATARI SUPERLEDGER
(accounting program)
High Country Software Systems
9551 Green Court
Westminster, CO 80030
(303) 427-9036
48K — Diskette
$249.00

This is a small-scale general purpose ledger program designed to handle input of numbers no larger than $999,999.99. Professional accountants and amateurs who want to keep accurate records can use this simple bookkeeping system. It creates ledger files for up to 300 accounts.

THE MONEY PROCESSOR
(personal finance program)
Luck Software
1160 Niblick Road
Paso Robles, CA 93446
48K — Diskette
$80.00

Retire your pencil and calculator and handle all your personal accounts with this easy-to-use accounting program. A menu-driven electronic worksheet, it allows you to get grand totals of all your financial transactions.

BUSIPAK-I
(business program)
Elcomp Publishing, Inc.
P.O. Box 1194
Pomona, CA 91769
(714) 623-8314
48K — Diskette
$98.00

Complete package for the small business. Busipak includes a format for creating a mailing list, and can be used for order entry, inventory control and invoicing.

ATARI BASIC QUICK REFERENCE GUIDE
(reference card)
John Wiley & Sons, Inc.
605 Third Avenue
New York, NY 10158
(212) 850-6000
$2.95

Instant information about ATARI BASIC is printed on this 6″ × 12″ fold-out card that can sit beside your computer.

NEW PRODUCTS

A.E.
(game)
Broderbund Software
1938 Fourth St.
San Rafael, CA 94901
(415) 456-6424
48K — Diskette
$34.95

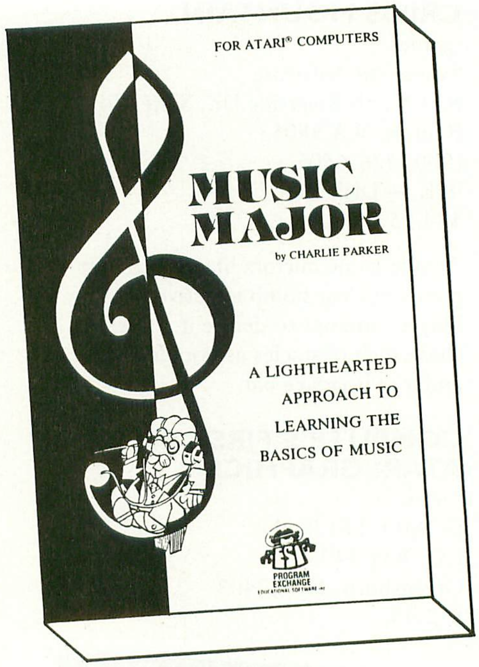
The A.E. are coming! Beware! Squadrons of menacing sting rays are streaking down from the sky to attack you. You're doomed to be pestered forever unless you drive the A.E. away (A.E. is Japanese for "sting rays"). It's a fast-paced arcade game with eight levels of play that can be played with joystick or paddle.

MAGNUM ISOLATOR
(electrical control)
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Natick, MA 01760
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WITNESS
(game)
Infocom, Inc.
55 Wheeler St.
Cambridge, MA 02138
(617) 492-1031
32K — Diskette
$49.95

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MUSIC MAJOR
(educational program)
Educational Software, Inc.
4565 Cherryvale Ave.
Soquel, CA 95073
(408) 476-4901
32K — Cassette or Diskette
$39.98

Fundamentals of music are taught in comprehensive lessons designed for all learning levels. Exercises also contain a teaching mode, and a quiz-master utility generates tests. Manual serves as study guide and reference book.

MILES ORDER/ENTRY INVOICING MODULE
(invoice/order program)
Miles Computing
7136 Haskell Ave., #204
Van Nuys, CA 91406
(203) 994-6279
48K — Diskette
$79.95

This package can be fully integrated with Atari's Bookkeeper program and automatically posts information to the Atari software. It is designed for the entry of sales orders and shipping data, and will print invoices, keep address records, and generate back-order reports.

MILLIONAIRE
(game)
Blue Chip Software
19824 Ventural Blvd., Suite 125
Woodland Hills, CA 91364
(213) 881-8288
48K — Diskette
$79.95

Learn how to invest your money with this popular simulation of stock market transactions. This complex game is fun and educational. Your object, of course, is to become a millionaire by playing the stock market and the game can be enjoyed by novice or experienced investors.

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Los Angeles, CA 90045
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(800) 421-3930 (orders)
48K — Diskette
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This top-selling financial management system is now available for the ATARI computers. It can perform a variety of accounting functions — from balancing several checkbooks to monitoring cash flow, checks, credit cards, assets, liabilities, income and expenses, as well as printing statements.

DISKED
(utility)
Amulet Enterprises
P.O. Box 25612
Garfield Heights, OH 44125
(216) 475-7766
24K — Diskette
$89.95

These utility programs can view and edit the contents of any sector in hex, decimal or character (ATASCII or screen code). Also disassembles programs into 6502 mnemonics using virtual addressing. You can recover deleted files, map used and crashed sectors, copy any sector or block of sectors, and move cassette files onto disk or back to cassette.

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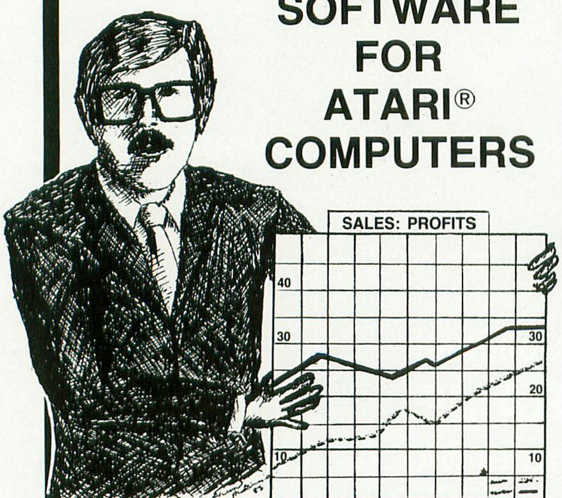
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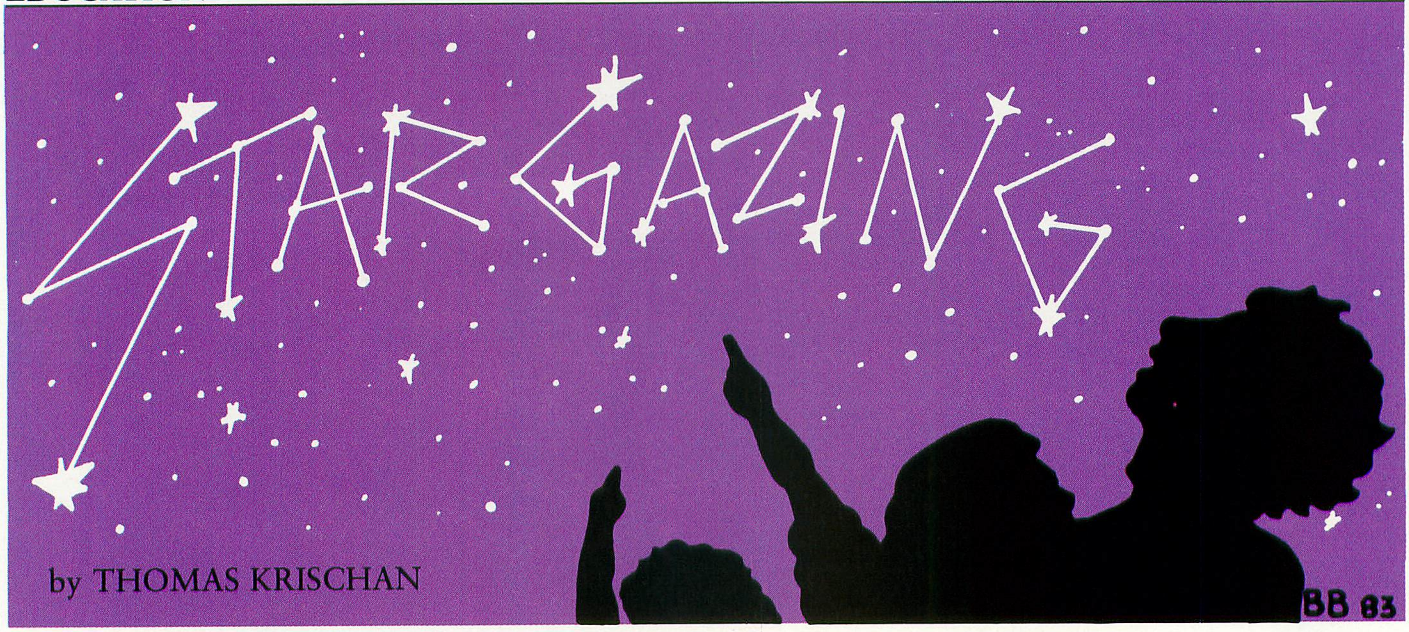
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There are several different techniques for presenting educational material via computer. Far too often, the presentation turns out to be a reading assignment off the display screen. Text books are far better media for this technique. Computers have the ability to display charts, graphics and illustrations dynamically.

Line drawings in text books are static. The text refers to these line drawings to enlighten the reader about the topic being discussed. How often have you looked at some text book drawing that is full of imposing lines and dots? The text had referred you to this drawing because of the obvious trend of some line. You say to yourself, "What trend? Perhaps it's obvious to the author, but it's sure not obvious to me!".

If, on the other hand, you were able to first see the dots and then watched as the line was being drawn, then it would be obvious. Computers can do this task very nicely. My suggestion to the educational software developer is to use text to enlighten the viewer about the drawing and not the other way around.

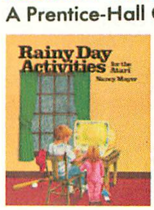
The example program presented here is an astronomy quiz. Dots are plotted to represent a star arrangement and lines are drawn (connecting the stars) for their appropriate constellation. The example could easily have been a graph of GNP or stock charting, but I preferred to demonstrate something that was a little less abstract and a little more down to earth. Hmm, scratch that.

When you run the program you will see the title display screen and a bell will ring; class is in session. The program will ask you a question and give three possible answers for you to choose from. Select any one and you will immediately find out whether you were correct or not. Your answer is displayed as an arrangement of stars. The program will pause here to allow you to read the additional material, press any key to continue. The program will automatically continue on after 45 seconds; just in case you didn't read the instructions.

```
20 REM . *** MAIN PROGRAM ***
22 DIM GUESS1$(60),GUESS2$(40),GUESS3$(4
  0),ASK1$(40),ASK2$(80),STAR(20,2)
23 RIGHT=0:WRONG=0:TOTAL=0
24 LIGHT=10:MEDIUM=6:DARK=0:GREEN=12:
  RED=4:YELLOW=1:
  BLACK=0:BLUE=7
25 PAUSE=5100:NOISE=5000:
  BUZZ=5050:TWINKLE=5200:WAIT=5150:QUIZ
  =100:ERROR=
  5300:   SCORE=200
  :INTRO=6000
  :START=23
26 CURSOR=752:OUT=1:ATTRACT=77:UNTOUC
  H=255:RESPONSE=764:OFF=0:KEYBOARD=
  53775:DRAW=7000
27 WINDOW=2:TEXT=1:TEXTCAPS=0:BACKGRN
  D=4:BACKTEXT=2:SMALL=0:AVERAGE=1:
  LARGE=2:PICTURE=7
28 VOICE0=0:PURE=10:NORMAL=8
29 TRAP 80:GOSUB INTRO
30 FOR QUESTION=1000 TO 1400 STEP 100:
  TOTAL=INT(QUESTION/100-9):GOSUB QUI
  Z:POKE ATTRACT,OUT
40 NEXT QUESTION
50 GOSUB SCORE
60 GOTO START
80 TOTAL=TOTAL-1:GOSUB SCORE
99 GOTO START
100 REM . *** QUIZ ***
110 GRAPHICS SMALL:POKE CURSOR,OUT:SETC
  OLOR BACKTEXT,BLACK,DARK:SETCOLOR T
  EXT,BLACK,LIGHT
115 RESTORE QUESTION:READ ASK1$,ASK2$
118 POSITION 0,0:? #6;"QUESTION NUMBER ";
  TOTAL;"      NUMBER CORRECT ";RIGHT
120 POSITION 0,1:? #6;ASK1$
121 POSITION 0,2:? #6;ASK2$
125 RESTORE QUESTION+30:READ GUESS1$,CO
```

continued on page 74





Rainy Day Activities



STARGAZING *continued from page 72*

```
    NST1,GUESS2$,CONST2,GUESS3$,CONST3,C
    ORRECT
130 POSITION 0,5:? #6;GUESS1$
140 POSITION 0,7:? #6;GUESS2$
150 POSITION 0,9:? #6;GUESS3$
155 POSITION 0,16:? #6;
    "       PRESS ATARI KEY TO QUIT"
160 KEY=PEEK(KEYBOARD):IF KEY=UNTOUCH T
    HEN 160
161 IF PEEK(RESPONSE)=31 THEN ANSWER=1:
    GOTO 170
162 IF PEEK(RESPONSE)=30 THEN ANSWER=2:
    GOTO 170
163 IF PEEK(RESPONSE)=26 THEN ANSWER=3:
    GOTO 170
166 IF PEEK(RESPONSE)=39 THEN QUESTION=Q
    UESTION-100:TOTAL=TOTAL-1:GOTO SCORE
169 GOTO ERROR
170 POSITION 15,12:IF ANSWER=CORRECT THE
    N ? #6;"YES":GOSUB NOISE:
    RIGHT=RIGHT+1:GOTO 190
175 ? "SORRY, THAT'S WRONG
    ":GOSUB BUZZ
190 GOSUB DRAW
191 ? :? :? :? "     PRESS ANY KEY TO CONTI
    NUE"
199 GOSUB WAIT:RETURN
200 REM . *** SCORE ***
210 GRAPHICS AVERAGE:POKE CURSOR,OUT:SE
    TCOLOR BACKGRND,GREEN,DARK:SETCOLO
    R WINDOW,GREEN,DARK
211 SETCOLOR TEXT,YELLOW,MEDIUM
215 WRONG=TOTAL-RIGHT
220 POSITION 0,0:? #6;"YOU ANSWERED "
230 POSITION 0,1:? #6;TOTAL;" QUESTIONS"
240 POSITION 0,3:? #6;RIGHT;" CORRECTLY"
250 POSITION 0,4:? #6;WRONG;" INCORRECT
    LY"
260 POSITION 0,6:? #6;INT((RIGHT
    /TOTAL)*100);" PERCENT!!!!"
265 REM . SELECT APPROPRIATE RESPONSE
270 RESTORE INT(RIGHT/TOTAL*6)*10+500:RE
    AD GUESS1$
275 REM . PUT RESPONCE INTO A STRING
280 POSITION 0,9:? #6;GUESS1$
290 ? "    PRESS ANY KEY TO CONTINUE"
299 GOSUB WAIT:RETURN
500 DATA BETTER LUCK NEXT    TIME
510 DATA NOT TOO GOOD, BUT    YOU'RE LEA
    RNING!"
520 DATA NICE TRY!
530 DATA GOOD JOB!
540 DATA VERY GOOD!!
550 DATA EXCELLENT!! THAT'S   ALMOST A PER
    FECT   SCORE.
560 DATA TREMENDOUS!! THAT'S A PERFECT SC
    ORE!!
1000 REM .** QUESTION NO.1 **
1010 DATA What is the giant constellation in the
1020 DATA southeastern skies during the winter?
1030 DATA 1. SCORPIUS,
   7100040 DATA 2. ORION,
   7110
1050 DATA 3. URSA MAJOR,7120
1060 DATA 2
1100 REM .** QUESTION NO.2 **
1110 DATA Which star of the winter sky is called
1120 DATA the Dog Star?
1130 DATA 1. SIRIUS,7130
1140 DATA 2. VEGA,7140
1150 DATA 3. ARCTURUS,7150
1160 DATA 1
1200 REM .** QUESTION NO.3 **
1210 DATA What constellation name is also the
1220 DATA name of a galaxy?
1230 DATA 1. PLEIADES,7160
1240 DATA 2. TAURUS,7260
1250 DATA 3. ANDROMEDA,7170
1260 DATA 3
1300 REM .** QUESTION NO.4 **
1310 DATA What constellation forms a lazy W or M
1320 DATA depending on when you look at it?
1330 DATA 1. CASSEOPEIA,7180
1340 DATA 2. GEMINI,7190
1350 DATA 3. AURIGA,7200
1360 DATA 1
1400 REM .** QUESTION NO.5 **
1410 DATA Which constellation is the shape of a
1420 DATA question mark or sickle?
1430 DATA 1. URSA MAJOR,7120
1440 DATA 2. TAURUS,7160
1450 DATA 3. LEO,7210
1460 DATA 3
5000 FOR PITCH=200 TO 2 STEP -3:SOUND VOI
     CE0,PITCH,PURE,NORMAL:NEXT PITCH:SO
     UND VOICE0,OFF,OFF,OFF:RETURN
5050 FOR PITCH=50 TO 255 STEP 3:SOUND VOIC
     E0,PITCH,PURE,NORMAL:     NEXT PITCH:
     SOUND VOICE0,OFF,OFF,OFF:RETURN
5100 FOR TIME=0 TO 300:NEXT TIME:RETURN
5150 FOR TIME=0 TO 50:NEXT TIME:TIME=0
5160 KEY=PEEK(KEYBOARD):IF KEY=UNTOUCH A
     ND TIME<2000 THEN TIME=TIME+1:GOTO 5
     160
5170 FOR TIME=1 TO 3:NEXT TIME:RETURN
5200 FOR FLASH=1 TO 100:SOUND VOICE0,40,P
     URE,NORMAL:HUE=RND(0)*16:LUMIN=HUE:
     SETCOLOR TEXTCAPS,HUE,LUMIN
5299 SOUND VOICE0,15,PURE,NORMAL:NEXT FL
     ASH:SOUND VOICE0,OFF,OFF,OFF:RETURN
5300 ? "OOPS.....THAT'S THE WRONG KEY":GO
     SUB NOISE:GOTO QUIZ
6000 REM . ***INTRODUCTION***
6003 GRAPHICS AVERAGE:POKE CURSOR,OUT:SE
     TCOLOR BACKGRND,YELLOW,DARK:SETCOL
     OR WINDOW,YELLOW,DARK
6004 SETCOLOR TEXT,YELLOW,MEDIUM:SETCOLO
     R TEXTCAPS,GREEN,MEDIUM
```

continued on page 76

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By Westmoreland & Gilman from Adventure

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DELTA DRAWING

By Computer Access Corporation
From Spinnaker Software

Children create stunning graphics! Kids learn programming and create colorful drawings on screen using single keystroke commands to control the Delta cursor. Drawings are stored as programs and can be used to create complex pictures, patterns and designs. Save drawings on disk or graphics printer. Simple and easy to produce computer graphics for ages 4 to 14. You don't have to read, write, or even know English!

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By Cindy and Andrew Bartorillo from Acorn

Learn the basics of a foreign language. LANGUAGE TEACHER offers hundreds of word combinations, verb conjugations and phrases. There is an option for having multiple-choice answers and for being retested on missed items. Full printer capability and a great deal of "human engineering" further enhance the programs. Teachers will appreciate the ample documentation and the ability to get printouts of quizzes. Currently available languages are: French, Spanish, Italian and German.

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By Sparky Starks
From Adventure International

This is one game that will bug you! Wacky arcade-style machine language game for one or two players. Your garden has fallen into a Florida sinkhole where weird forces have mutated a bevy of bugs into a contingent of killers. Control the seven types of bugs using DDT on the pesky pests! You'll enjoy these bugs in your computer! Graphics oriented, real-time action with great sound.

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STARGAZING *continued from page 74*

```
6005 POSITION 0,1:? #6;"self teaching series"
6010 POSITION 0,7:? #6;"     A  WINTER"
6020 POSITION 0,9:? #6;"     ASTRONOMY"
6030 POSITION 0,11:? #6;"     Q U I Z"
6060 ? :? :? "           by Thomas M. Krischan";
6070 GOSUB PAUSE
6080 GOSUB TWINKLE
6081 ? :? :? :? "          PRESS ANY KEY TO BEG
     IN."
6099 GOSUB WAIT:RETURN
7000 REM .*** DRAWING ***
7010 GRAPHICS PICTURE:TRAP 7099:POKE CURS
     OR,OUT:SETCOLOR TEXTCAPS,RED,MEDIUM:
     SETCOLOR TEXT,BLACK,LIGHT
7015 SETCOLOR WINDOW,BLUE,2:SETCOLOR BA
     CKGRND,BLACK,DARK
7021 IF ANSWER=1 THEN CONST=CONST1
7022 IF ANSWER=2 THEN CONST=CONST2
7023 IF ANSWER=3 THEN CONST=CONST3
7029 REM . ***BLUE STARS***
7030 RESTORE CONST:FOR I=1 TO 20:READ X,Y
     :STAR(I,1)=X:STAR(I,2)=Y:IF X>0 THEN
     NEXT I
7035 COLOR 3:FOR I=1 TO 20:IF STAR(I,1)>0
     THEN PLOT STAR(I,1),STAR(I,2):NEXT I
7036 REM . ***RED  STARS***
7040 RESTORE CONST+1:FOR I=1 TO 20:READ X
     ,Y:STAR(I,1)=X:STAR(I,2)=Y:IF X>0 TH
     EN NEXT I
7041 COLOR 1:FOR I=1 TO 20:IF STAR(I,1)>0
     THEN PLOT STAR(I,1),STAR(I,2):NEXT I
7044 REM . ***WHITE LINE***
7045 GOSUB CONST:GOSUB WAIT:RESTORE CON
     ST+2:FOR I=1 TO 20:READ X,Y:STAR(I,1)
     =X:STAR(I,2)=Y:IF X>0 THEN NEXT I
7050 COLOR 2:FOR I=1 TO 20:IF STAR(I,1)>0
     THEN PLOT STAR(I,1),STAR(I,2):DRAWTO
     STAR(I+1,1),STAR(I+1,2):NEXT I
7099 RETURN
7100 DATA 20,48,24,52,22,54,20,60,24,64,38,
     62,48,52,52,48,64,42,72,38,
     84,24,88,
     28,89,32,88,36,-1,-1
7101 DATA 68,40,  -1,-1
7102 DATA 20,48,24,52,22,54,20,60,24,64,38,
     62,48,52,52,48,64,42,68,40,72,38,88,28,
     84,24,88,28,89,32,88,36,-1,-1
7105 ? "SCORPIUS is a large constellation      inclu
     ding the shape of a scorpion's  "
7106 ? "tail. It is located in the southern    sky dur
     ing the summer months.        ";:RETURN
7110 DATA 62,42,62,46,62,50,66,50,68,50,72,
     50,-1,-1
7111 DATA 28,44,44,24,84,64,88,40,-1,-1
7112 DATA 28,44,44,24,84,64,88,40,-1,-1
7115 ? "ORION appears as 4 stars forming a     larg
     e lazy Z lying on its side with a"
7116 ? "belt of three stars in a close line.  A sword
     hangs from the belt.         ";:RETURN
7120 DATA 24,36,40,34,54,38,68,44,72,56,92,
     56,96,44,-1,-1
7121 DATA -1,-1
7122 DATA 24,36,40,34,54,38,68,44,72,56,92,
     56,96,44,-1,-1
7125 ? "URSA MAJOR (the Big Bear) is often     r
     eferred to as the Big Dipper.       "
7126 ? "Actually, the dipper is only a part    of Ursa
     Major.                     ";:RETURN
7130 DATA 32,28,44,34,42,40,38,46,52,32,76,
     20,84,44,-1,-1
7131 DATA 80,32,-1,-1
7132 DATA 38,46,42,40,44,34,32,28,44,34,52,
     32,80,32,84,44,-1,-1
7135 ? "SIRIUS is the brightest star in the    conste
     llation Canis Major (Big Dog)  "
7136 ? "which follows Orion the hunter across the sk
     y.                          ";:RETURN
7140 DATA 52,20,60,28,52,36,60,52,68,44,-1
     ,-1
7141 DATA 60,20,-1,-1
7142 DATA 52,20,60,20,60,28,52,36,60,52,68,
     44,60,28,-1,-1
7145 ? "VEGA is the brightest star in the       conste
     llation Lyra. Vega is on the    "
7146 ? "western horizon and sets shortly aftersundow
     n with the deepening of winter";:RETURN
7150 DATA 64,16,56,8,44,16,48,40,62,
     38,60,38,-1,-1
7151 DATA 60,64,-1,-1
7152 DATA 64,16,56,8,44,16,48,40,60,64,62,
     38,64,16,-1,-1
7155 ? "ARCTURUS is the brightest star in the conste
     llation Bootes (called Bear      "
7156 ? "Driver & Herdsman). It is shaped like a kit
     e and is near the Big Dipper    ";:RETURN
7160 DATA 24,24,60,28,70,34,74,36,76,36,80,
     38,76,42,72,44,28,52,-1,-1
7161 DATA 87,11,89,9,91,7,93,5,95,7,93,9,-
     1,-1
7162 DATA 24,24,60,28,70,34,74,36,76,36,80,
     38,76,42,72,44,28,52,-1,-1
7165 ? "PLEIADES sometimes called Seven          Si
     sters appears to the naked eye as a"
7166 ? "group of 6-7 stars that form a tiny    dippe
     r nearly overhead in January.";:RETURN
7170 DATA 24,16,52,
     28,72,32,92,36,76,40,52,40,20,40,-1,-1
7171 DATA 51,16,52,16,-1,-1
7172 DATA 24,16,52,28,72,32,92,36,76,40,52,
     40,20,40,-1,-1
7175 ? "ANDROMEDA is a constellation which      sh
     ares a star with another constell- "
7176 ? "ation called the Great Square of         Pegas
     us.";:RETURN
7180 DATA 28,28,62,30,74,42,-1,-1
7181 DATA 48,40,80,44,88,
     24,-1,-1
7182 DATA 28,28,48,40,62,30,74,42,80,44,88,
     24,-1,-1
7185 ? "CASSEOPIA is in the sky during all      seas
```

continued on page 78

STARGAZING *continued from page 76*

```
ons. It never goes below the          "
7186 ? "horizon for North American viewers.";:RET
URN
7190 DATA 104,16,80,20,68,48,108,44,112,56,
-1,-1
7191 DATA 32,24,32,44,-1,-1
7192 DATA 104,16,80,20,32,24,32,44,68,48,10
8,44,112,56,-1,-1
7195 ? "GEMINI (The Twins) is seen primarily  as
two bright stars in the eastern     "
7196 ? "January skies.";:RETURN
7200 DATA 80,20,88,44,44,52,28,44,25,44,44,
20,46,18,40,14,-1,-1
7201 DATA 32,20,-1,-1
7202 DATA 80,20,88,44,44,52,28,44,32,20,44,
20,80,20,-1,-1
7205 ? "AURIGA is roughly the shape of a        pent
agon very close to overhead in    "
7206 ? "January.";:RETURN
7210 DATA 14,26,20,20,28,20,36,20,42,26,50,
20,48,14,84,44,80,40,72,48,73,54,80,56,
92,60,64,80,56,72,53,80,-1,-1
7211 DATA -1,-1
7212 DATA 84,44,80,40,72,48,73,54,80,56,92,
60,64,80,56,72,53,80,-1,-1
7215 ? "LEO (The Lion) rises in the east in    Janu
ary. To find Leo - imagine a hole"
7216 ? "poked in the bottom of the Big Dipper.The
water falls on the lion's head.";:RETURN
7220 DATA 36,60,20,60,36,48,84,48,74,38,76,
24,92,16,102,26,-1,-1
7221 DATA 88,60,-1,-1
7222 DATA 36,60,20,60,36,48,36,60, 88,60,84,
48,74,38,76,24,92,16,102,26,-1,-1
7225 ? "LEO's major star is Regulus.":RETURN
7260 DATA 24,24,60,28,70,34,74,36,76,36,76,
42,72,44,28,52,87,11,89,9,91,7,93,5,95,
7,93,9,-1,-1
7261 DATA 80,38,-1,-1
7262 DATA 24,24,60,28,70,34,74,36,76,36,80,
38,76,42,72,44,28,52,-1,-1
7265 ? "TAURUS (The Bull) is a winter            con
stellation shaped somewhat like a "
7266 ? "V with a cluster of stars at the tip";:RETU
RN
7270 DATA 62,42,62,46,62,50,66,50,68,50,72,
50,-1,-1
7271 DATA 28,44,27,44,28,43,27,43,43,24,44,
24,84,64,88,40,87,40,88,41,-1,-1
7272 DATA 28,44,44,24,84,64,88,40,-1,-1
7275 ? "The four major stars of Orion in orderof their
brightness are 1.BETELGEUSE"
7276 ? "2.RIGEL 3.BELLATRIX and 4.SAIPH";:R
ETURN
7280 DATA 28,28,74,42,-1,-1
7281 DATA 48,40,62,30,63,30,80,43,80,44,80,
45,81,44,81,43,81,45,82,43,82,44,82,45,
88,23,87,23,88,24,87,24,-1,-1
7282 DATA 28,28,48,40,62,30,74,42,80,44,88,
24,-1,-1
7285 ? "The four major stars of Casseopeia     in or
der of brightness are 1.SCHEDAR "
7286 ? "2.CAPH 3.NAVI and 4.RUCHBAH.";:RE
TURN
7290 DATA 24,24,60,28,28,52,-1,-1
7291 DATA 80,38,70,34,74,36,76,36,76,42,72,
44,87,11,89,9,91,7,93,5,95,7,93,9,-1,
-1
7292 DATA 24,24,60,28,70,34,74,36,76,36,80,
38,76,42,72,44,28,52,-1,-1
7295 ? "TAURUS contains the Hyades and the      Pl
eiades clusters. Both are open        "
7296 ? "clusters containing hundreds of stars.";:RE
TURN
7300 DATA 104,16,80,20,68,48,108,44,112,56,
-1,-1
7301 DATA 32,24,32,44,-1,-1
7302 DATA 104,16,80,20,32,24,32,44,68,48,10
8,44,112,56,-1,-1
7305 ? "CASTOR and POLLUX mark the heads of
the famous twins.":RETURN
```

TYPO TABLE

Variable checksum = 6679647

Line num	range	Code	Length
20	- 27	SN	578
28	- 118	EA	311
120	- 166	MS	461
169	- 230	EJ	340
240	- 520	KF	439
530	- 1100	ER	338
1110	- 1250	ET	285
1260	- 1430	FW	310
1440	- 5300	AL	469
6000	- 6099	BM	393
7000	- 7041	BE	547
7044	- 7105	BV	565
7106	- 7125	XG	572
7126	- 7145	PA	578
7146	- 7162	XB	542
7165	- 7182	OQ	542
7185	- 7205	BX	574
7206	- 7222	NG	521
7225	- 7275	TE	577
7276	- 7292	AO	515
7295	- 7305	LK	322

TYCOON

The Programmers Workshop
5230 Clark Ave., Suite 23
Lakewood, CA 90712
(213) 804-1475
$19.95, 24K — diskette & cassette

Reviewed by Dave Mentley

The inspiration for **Tycoon** clearly came from that famous Parker Brothers board game — Monopoly. You now have an alternative to sitting around the kitchen table at 2 a.m. arguing whether or not you need four houses to buy a hotel. With this game you can sit around the tube and practice trading stocks, gold and real estate, merely by putting your thumb to the joystick button.

Tycoon is a board game written in BASIC for one to four players. The computer will play against a single person, or four players can compete if you have four joysticks. The game code appears to be well written and totally crashproof, however there are a few typos in the screen presentation.

Players are asked their names at the start of the game. This is the only keyboard input required. A pair of dice is rolled by pressing the red joystick button, identical to Monopoly. (By the way, the U.S. Supreme Court has ruled that Monopoly is not a trademark as it has become generic. Tycoon could have been called Monopoly.) The board squares which lie on the left half of the screen are unmarked because they are too small for a meaningful label. This takes some fun out of the dice roll. You could hope for snake eyes to land on Inheritance if you knew where it was on the board. As it is, the right half of the screen tells you where you are when you land on it. It also tells you want your options are — BUY, SELL, PASS, etc. and what your estate is worth.

There are ten types of squares on the board:

GOLD— you can buy units (ounces?) when you land on GOLD. The price per unit changes rapidly throughout the game affecting your net worth.

STOCKS— The stock value acts as a portfolio with less volatility than the gold. There are no individual securities you can trade.

REAL ESTATE— Rent is due when you land on real estate owned by another player. Rents and property values escalate as the game proceeds.

GAMBLE— This is an uncontrollable bet with a 50% chance of winning and a 2:1 payoff. The computer decides how much you bet. This is a strange way to gamble.

INHERITANCE— extra income.

INCOME TAX— a nuisance which only takes 10% (of net worth!). This is clearly not an income tax.

PAY DAY— just like passing GO except you get ever increasing amounts.

DOOM— all players' holdings except cash decrease in value by 50%.

BOOM— all players' non-cash holdings increase by 50%. BOOM and DOOM make the game very volatile.

DOOM INSURANCE— can be purchased for $300 and will make you immune to DOOM one time.

I am still trying to decide on the value of a game such as Tycoon. It would seem to me that the social impact of digital Tycoon will probably never be as great as the cardboard and paper games like Risk, Monopoly or Scrabble.

STOCK MANAGEMENT, REV. 1.1

Atari Program Exchange (APX)
P.O. Box 3705
Santa Clara, CA 95055
(408) 727-5603
(800) 672-1850 inside California
(800) 538-1862 outside California
$22.95, 32K — diskette

Reviewed by Dave Mentley

This well-polished, low-priced record-keeping program from APX will be very useful to ATARI owners who buy and sell securities for investment or speculation. I've found that this population group is actually quite small, but the **Stock Management** program is an excellent example of what a home computer can do.

It is, however, fundamentally a *reporting* program — not a *management* program. In order to "play" the stock market you need instant information from many sources and you really need personal contact over the phone. For recordkeeping and valuation of your portfolio of stocks though, this program is ideal. It does not handle sophisticated transactions such as "short selling" or options trading, but we are not planning to open a branch of Merrill Lynch with our ATARI either.

The disk comes with a sample data base built by the author, and this makes learning the utility very easy. Actually, a sample data base or data file makes learning any new software package much easier. This program is menu-based to minimize typing and simplify use. One shortcoming (which some may call a feature) is that the author did not disable the [BREAK] key. Two POKEs in BASIC will prevent an accidental [BREAK]. The menu contains six possible selections leading to all of the program subroutines. These items are: (1) Enter New Transactions, (2) Correct Transactions, (3) List All Transactions, (4) Status of Portfolio, (5) Profit or Loss for Single Stock, and (6) Profit or Loss for the Year. In order to enter transactions you should have your brokerage slips by your computer. You will need to enter the stock name, ticker symbol, transaction (BOT, SLD, DIV, etc.) date, exchange (NYSE, AMEX, OTC, etc.), share price, number of shares and the broker's commission. This is a lot of data and this program helps you to get it neatly arranged on your floppy disk instead of in your dresser drawer.

Once you have done the dirty work of entering the data, you can begin to have some fun with the numbers. The only other inputs you need after entering are the daily (or hourly) share prices. Just by changing the price according to the daily paper or your Dow Jones service, you can see in a flash how much your portfolio is worth "on paper" or in this case "in computer". You can produce any of the last three reports listed above just by entering the share price. All reports can be sent to a printer for a hard copy or to the screen if you just want a quick look.

If you feel like turning your stock into cash, just reach for the phone, call your broker and make that transaction real. The beauty of this program is its organizing ability and simplicity.

DESK SET

The Programmers Workshop
5230 Clark Ave., Suite 23
Lakewood, CA 90712
(213) 804-1475
$29.95, 40K — disk

Reviewed by Clark Nobil

Desk Set is a well designed program that thoughtfully combines a daily appointment schedule, perpetual calendar, and card file (mailing list) section. It marks the long-awaited entry of business quality software capable of serving either personal or light office needs at a reasonable price. Desk Set is a kind of electronic date book with all the speed, accuracy, and convenience of a computer.

The daily appointment schedule allows you to enter up to 400 separate, daily appointment or "things-to-do-today" schedules — each with up to 15 entries per day. The perpetual calendar displays any past, present, or future month. The card file section permits you to store, edit, sort, and print up to 200 names, addresses, phone numbers, and brief messages. Desk Set replaces several smaller mailing list and appointment calendar programs by combining them into a larger, more powerful program with quick access between sections and with some of the sophisticated features found on more expensive data base programs. Numerous prompts guide you at every step to prevent accidental crashing or the need to restart the program.

The program begins with a main menu that asks you whether you want to access the calendar or card file section. If you respond with "calendar," the program requests the month, year, and day and displays the calendar for that month. You may then view the appointment schedule for that day, or go on to the appointment schedule for the previous or next day. When an appointment schedule is selected, the screen displays a schedule with 10 hourly time slots, from 8:00 a.m. to 5:00 p.m., and five other slots for extra appointments or important notes. The program allows entry of up to 22 characters for each of the time slots — plenty of room for a name and phone number or short note. At the bottom of this screen, a menu appears which permits you to add or delete an entry, print the appointment schedule, erase any outdated schedules, or return to the main menu.

The card file section of the program accepts up to 200 records with separate fields for name, address, city, state, zip, telephone number (with area code), and a short message. The user can then add, edit, sort, view, or print records. It is, in fact, here in the card file section that the program truly excels with some refreshingly new and original features. If you wish to view records, there are six options in the search mode: number or range of record number, area code, state, zip code, or all. If you want to print these same card file records, you must specify whether the addresses will be printed on labels, envelopes, or in full format.

Although it is relatively new, Desk Set is likely to become the standard by which integrated appointment calendar/small mailing list programs are judged in the future.

You can also specify if telephone numbers should be printed, so the card file section actually serves as powerful mini data base with a wide range of printing options. A housewife, for instance, might use this section as a handy place to organize addresses and phone numbers of friends, or print envelopes or labels for holiday cards. A salesman might use the card file section as a place to store business leads or prospects, printing either envelopes or labels as the need arises, even creating a "telephone worksheet" for follow-up calls.

The sort option on the card file menu is also helpful. It permits the automatic realphabetizing of names and renumbering of records so that the last records added can be included in a newly alphabetized, card file listing.

Although it is relatively new, Desk Set is likely to become the standard by which integrated appointment calendar/small mailing list programs are judged in the future. Anyone, especially office workers, who formerly used a date book or appointment calendar but who now want to add the same capability to a home or office computer should find Desk Set a welcome addition. Not surprisingly, the program's eight-page documentation is both clear and concise, enabling you to start putting the program's full potential to work in 20 minutes.

P.M.P. (PROPERTY MANAGEMENT PROGRAM) 2000

T & F Software Co.
10902 Riverside Drive
North Hollywood, CA 91602
(213) 501-5845
$219.95, 48K — disk

Reviewed by Richard DeVore

If you own an ATARI 800 with 48K, a disk drive, an 80-column printer, VisiCalc *and* some apartment buildings, Bruce Familian of T & F Software Company has developed a set of templates that will allow you to keep track of your property revenues and prepare your rental statements.

PRODUCT REVIEWS

P.M.P. 2000 comes as a set of four diskettes in a binder along with a set of clear instructions. The instructions are printed on thick paper and should handle well with extensive use of the program. It also comes with a licensing agreement that you probably should have your lawyer read prior to purchasing the package. It has all the known disclaimers, which may be necessary, but I feel that the manufacturer should warrant the product to do what is claimed rather than warn you that it won't take responsibility.

I must say, in all fairness, that in the one contact that I had with Bruce Familian, he answered all my questions and sent me the new version of the program for this review. My criticism of disclaimers is applicable to any company that uses them, not just T & F.

Each template is capable of tracking 25 units, and the limit is set by the computer's memory, not the program.

The instructions lead you step by step through every phase of the program's use. I found a few errors, but nothing that you couldn't catch and compensate for. First, you should duplicate the set of disks to keep the originals safe. It is necessary to make up a set for each apartment building. The programs do not lend themselves to individual house rentals, but could be used for this is you were determined to do so.

Each template is capable of tracking 25 units, and the limit is set by the computer's memory, not the program. Most of the printouts require compressed print and VisiCalc, because the ATARI doesn't directly support many printers. It is set up for the Atari 825 printer (i.e. Centronics 737) and you may have to set your particular printer with BASIC prior to loading VisiCalc and the program. Familiarity with VisiCalc will make the application of this program easier and faster.

Diskette A contains four files. These are: APARTMENT STATUS REPORT, TENANT STATUS REPORT, CASH RECEIPT WORKSHEET and INVOICES. Diskette B and C contain: DISTRIBUTION OF EXPENSES/BANK ACCOUNT STATEMENT. Each disk is able to hold six month's worth. Diskette D has the INCOME/EXPENSE SCHEDULE both by month and YEAR TO DATE.

As in any program, you have to input the necessary information required by each report. The reports are structured to take input values and do the appropriate extensions such as return on investment, current tenant status, and bank balance. They also track expenses on the various units, which is extremely useful. The only thing that is not cross-linked well into previous input is the invoice section. In this format it is necessary to fill in almost all the blanks manually rather than just give it the unit number.

The example given in the instruction manual is for just one unit. I expanded to 25 units and found that the programs function well in larger volume. Any landlord should find P.M.P. 2000 a more than adequate tool for managing his property.

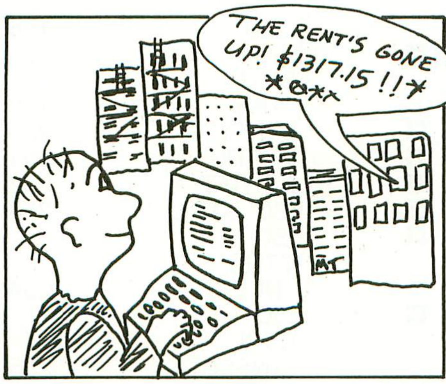


Table Information

Our custom font listings represent each ATASCII character as it appears on the video screen. You generate some characters by a single keystroke, for example, the regular alphabet. Others require a combination or sequence of keystrokes. In this table, ESC means *press and release* the escape key before pressing another key. CTRL or SHIFT means *press and hold* the control or shift key while simultaneously pressing the following key.

The Atari logo key (⅄) "toggles" inverse video for all alphanumeric and punctuation characters. Press the logo key once to turn it on; press again to turn it off. On the 1200XL there is no logo key; inverse video is controlled by a key on the function row. Decimal values are given as reference, and correspond to the CHR$ values often used in BASIC listings.

NORMAL VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	CTRL ,	0
	CTRL A	1
	CTRL B	2
	CTRL C	3
	CTRL D	4
	CTRL E	5
	CTRL F	6
	CTRL G	7
	CTRL H	8
	CTRL I	9
	CTRL J	10
	CTRL K	11
	CTRL L	12
	CTRL M	13
	CTRL N	14
	CTRL O	15
	CTRL P	16
	CTRL Q	17
	CTRL R	18
	CTRL S	19
	CTRL T	20
	CTRL U	21
	CTRL V	22
	CTRL W	23
	CTRL X	24
	CTRL Y	25
	CTRL Z	26
	ESC ESC	27
	ESC CTRL −	28
	ESC CTRL =	29
	ESC CTRL +	30
	ESC CTRL *	31
	CTRL .	96
	CTRL ;	123
|	SHIFT =	124
	ESC SHIFT CLEAR	125
	ESC DELETE	126
	ESC TAB	127

INVERSE VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	⅄CTRL ,	128
	⅄CTRL A	129
	⅄CTRL B	130
	⅄CTRL C	131
	⅄CTRL D	132
	⅄CTRL E	133
	⅄CTRL F	134
	⅄CTRL G	135
	⅄CTRL H	136
	⅄CTRL I	137
	⅄CTRL J	138
	⅄CTRL K	139
	⅄CTRL L	140
	⅄CTRL M	141
	⅄CTRL N	142
	⅄CTRL O	143
	⅄CTRL P	144
	⅄CTRL Q	145
	⅄CTRL R	146
	⅄CTRL S	147
	⅄CTRL T	148
	⅄CTRL U	149
	⅄CTRL V	150
	⅄CTRL W	151
	⅄CTRL X	152
	⅄CTRL Y	153
	⅄CTRL Z	154
	ESC SHIFT DELETE	156
	ESC SHIFT INSERT	157
	ESC CTRL TAB	158
	ESC SHIFT TAB	159
	⅄CTRL .	224
	⅄CTRL ;	251
	⅄SHIFT =	252
	ESC CTRL 2	253
	ESC CTRL DELETE	254
	ESC CTRL INSERT	255

WINDOW ON GTIA

This is the Assembly Language listing (Listing 2) that was inadvertantly omitted from "Window on GTIA" (ANTIC V.2, #1, page 48).

```
01 ;THIS IS THE ASSEMBLY-
   LANGUAGE ROUTINE USED
   IN
02 ;THE BASIC DEMO PROGR
   AM TO SWAP FROM GTIA
   TO
03 ;NON-GTIA MODE AT THE
   TOP OF THE TEXT WINDOW.
04 ;THE ROUTINE IS CALLED
   BY A DISPLAY LIST
05 ;INTERRUPT.  IT IS ASSE
   MBLED AT AN ARBITRARY
06 ;LOCATION OF $6E8, BUT
   WILL RUN AT ANY LOCATI
   ON
0100          * = $6E8
0110 DRKMSK   =  $4E
0120 SHFCOL   =  $4F
0130 CPM0     =  $2C0
0140 COLBAK   =  $D01A
0150 PRIOR    =  $D01B
0160 WSYNC    =  $D40A
0170 NMIRES   =  $D40F
0180          PHA
0190          STA NMIRES
0200          STA WSYNC
0210          LDA CPM0
0220          EOR SHFCOL
0230          AND DRKMSK
0240          STA COLBAK
0250          LDA #0
0260          STA PRIOR
0270          PLA
0280          RTI
0290          .END
```

PHOTO FUN CONTEST WINNER

An early bird from Sunnyvale, California has correctly identified the "mystery programmer" whose photo appeared on page 26 of the May 1983 ANTIC as Chris Crawford. Chris, designer of such classics as "Eastern Front (1941)" and "Legionnaire", is one of Atari's foremost programming talents. Our winner, Aaron Yelowitz, has requested as his prize the APX graphics adventure game "Sir Galahad and the Holy Grail". Happy Crusading, Aaron!

FULL-VIEW 80 DISPLAY CARD

Bit 3 Computer Corporation
8120 Penn Avenue South, Suite 548
Minneapolis, MN 55431
(612) 881-6955
$349.00

Reviewed by Fred Tedsen

The Full-View 80 is a board that provides an 80-column display for the ATARI 800. It is nicely packaged and comes with a fairly complete manual. Installation is very easy. The board plugs into the third memory slot and a cable with two plugs is routed out the back of the computer. One plug connects a cable to the monitor while the other is plugged into the monitor jack on the side of the ATARI. This allows switching between 40-column and 80-column displays on the same monitor. The monitor must be monochrome. You can, however, leave your TV set or a color monitor connected for color and 40-column displays.

The 80-column display is very readable. Most of the letters are nicely formed, and the lower case letters have full descenders. The ATARI block cursor has been replaced with a blinking underline, which is very easy to find on the screen. If you prefer a block cursor, a control key allows you to toggle between the underline cursor and a block cursor. The ATARI graphics characters are duplicated, though the appearance of some of them are quite different. One of the line-drawing graphic characters is incorrectly formed so that a perfect square cannot be drawn on the screen.

Editing programs is very much the same as standard ATARI 40-column editing. There are a few differences that take some getting used to, however. For example, the cursor does not wrap around at the bottom or top of the screen. Instead the screen is scrolled up or down one line. Since this moves a line off the screen, I quickly learned to not do it. A more bothersome feature is that if you make a change in the second line of a multiple-line statement, you must move the cursor back to the first line before pressing [RETURN]. This is really not as bad as it first seems since fewer statements take more than one screen line. Bit 3 indicates that they may change this in the future. A really nice added feature is a command that clears the line from the point after the cursor instead of deleting the entire line.

An unpublicized advantage of this board is speed. Listing programs on the screen and printing to the screen is about 30 percent faster on the 80-column screen than the 40-column screen. Additionally, since the Full-View 80 does not use the ANTIC chip to handle the display, turning ANTIC off with a POKE 559,0 speeds everything up another 30 percent or so without blanking the screen.

The board works very well with BASIC and with most assemblers. Debuggers, however, do not seem to work in 80-column mode. For word processing and file management, the 80-column versions of Letter Perfect and Data Perfect are the only compatible products.

Overall, I am very satisfied with the Full-View 80. The support I received from Bit 3 in tracking down problems running programs with the board was outstanding. With dual density drives and now 80-column display, the potential uses of the ATARI are rapidly expanding.

THE BOOKKEEPER KIT

Atari, Inc.
(800) 538-8543
(800) 672-1404 (Calif. only)
$249.95 — the Kit (diskette, keypad)
$149.95 — 48K — diskette only
$124.95 — keypad only

Reviewed by Ronald G. Boyer

The Bookkeeper Kit is Atari's entry in the small-business accounting field. The ATARI computers were never intended as business machines, and this software also has serious limitations. But for a small business, the combination is good enough to use until a true business system is warranted.

Although The Bookkeeper program's documentation is easy to read and explains simple accounting concepts, Atari advises the user to seek professional help when setting up accounts and deciding which accounting method to apply. As a CPA with ten years' experience on in-house minis and micros, as well as with client computers, I concur with this advice. Computers do not anticipate management, tax or financial problems. Nor do they review statements to assure accuracy and completeness. Consultation will still be an annual necessity for all except the smallest operation.

Full use of The Bookkeeper requires 48K, a printer, and one disk drive. System capacity is limited by small disks. The Bookkeeper can handle up to 1000 transactions per month (or posting period) but only a total of 350 different account numbers, plus customer numbers, plus vendor numbers. It does not support PERCOM's double-density mode, but single-density works fine.

Functionality: The Bookkeeper offers a well-documented, easy-to-use, double-entry accounting package. Statement formats and department structures have been integrated into the chart of accounts numbering system. The system can produce ten departmentalized profit and loss statements which are then combined into a consolidated statement. Department statements show profit and loss only. The chart of accounts is flexible enough for most applications.

The Bookkeeper will, in addition to the normal financial statements, provide lists of customers, vendors, checks written, cash received, invoices written, and general journal entries. It also will produce general ledgers, accounts receivable and accounts payable ledgers. The accounts receivable and accounts payable ledgers are not "aged," however.

The system does not collect employee data. This is a serious oversight since collecting data for quarterly tax returns is one of the functions best handled by a computerized accounting system, and is a feature included in programs for other microcomputers. Certainly, one of the greatest burdens for any small business is maintenance and filing of employee tax records.

The general ledger includes descriptions of each transaction, for example, check payee. That makes the general ledger much more valuable for analyzing account variances in the accounting period. The system allows 13 account entries per check and ten per journal entry — sufficient for most needs. A generous number of comment lines are available.

The profit and loss statement has columns for current period, year-to-date amounts, and percentage analysis; but the system cannot compare actual amounts to budgeted, or to prior year figures. This is a serious drawback.

Customer lists include only names and addresses; no monthly or year-to-date sales data are presented. The system will not issue invoices or monthly statements. Statements must

be hand typed from accounts receivable listings — an inexplicable ommission.

The Bookkeeper performs some accounts payable functions and allows the user to record checks. It does not, however, print checks. Worse, it will not keep or balance a checkbook.

Usability: The system is easy to understand and learn. This is no small feat given the complexity of the subject matter.

The complete package, marketed as The Bookkeeper Kit, includes a piece of hardware that everyone who has tried to use the ATARI in business has missed — a ten-key pad! The pad plugs into Port Two. It includes all numerics, return, escape, delete, Y (for yes), N (for no), period, a plus, and minus keys. All of these are needed for entering data into the program. It is a major step forward.

Unfortunately, the key pad is now usable only with The Bookkeeper. All of us who know the ten-key finger patterns have greatly missed this important piece of equipment. Atari customer service says the company is working on a program that will make the pad usable with other programs.

One serious complaint about the usability is that The Bookkeeper does not allow multiple disk drives. This means that the user often must swap the data disk and the program disk, when a function change is needed. Since most business users have at least two drives, this is an irritating and unnecessary limitation.

The system does not allow full-screen editing during data entry, but simply skipping through the fields using the return key permits moderately efficient correction of input data.

Reliability: Overall, The Bookkeeper performs as specified in the documentation and in the advertising brochures. Be careful; this system is only for the small business. There is not enough storage capacity for anything approaching a "medium-size" business.

If you are interested in this product, you should know about the flaw in the data-entry mode which necessitates saving data often: after entering data and pressing [RETURN] to complete a transaction, a second [RETURN] will crash the program and lose all data not previously saved. Recovery requires restarting the system.

Performance: The program loads slowly. Disks must be constantly switched, because the program only uses on disk drive.

On the plus side, the system avoids repetition of names by assigning numbers to vendors and customers.

Documentation: The documentation is excellent. It is complete, well-written, and includes a comprehensive example on a data disk. This gives the user experience and confidence that the process will work. Although the section dealing with accounting and bookkeeping concepts is also well-written, it will not replace formal education on accounting methods or tax laws. File layouts are not documented. Therefore, the user will not be able to easily interface The Bookkeeper to user-written programs.

Summary: Atari has produced a usable accounting package with good documentation and packaging. The Bookkeeper does have some shortcomings which could be eliminated with some simple programming changes. I still recommend it for the small retail or professional business with few employees. The program will not replace competent professional help for accounting and tax needs, but could substantially reduce fees an accountant would charge to plod through unorganized records. The program could also be useful to a person performing bookkeeping "write-up" services for a relatively small number of clients out of his/her home/office.

FULL-SCALE DBMS

	CCA DBMS	DATA PERFECT	FILE FAX	FILE MANAGER+
VERSION	4.1	1.3	Release 2	4D
SORTS				
Number of sort levels	10	4	8	3[w]
Ascending, descending, both	Both	Both	Ascending	Ascending
Mix ascending & descending	Yes	No	No	No
Outputs a new file	Yes[x]	Yes	No	No
Time to sort 50 records	2.2 min.	1.3 min.[y]	4.5 min.	0.9 min.
REPORTS AND LABELS				
Full screen layout	No	Yes	Yes	No
Report layout reediting	No	Easy	Easy	Easy
Report layout ease	Fair	Better	Best	Good
Number of computed fields	Many[z]	16	0	0
Number of subtotal fields	1	4	1[a1]	0[a2]
Blank lines at subtotal	No[a3]	Yes	No	No
Page breaks at subtotal	No	Yes	No	No
Text on subtotal line	No	No	Yes	No
Maximum report width	132	127	132	132
Number layouts per file	Many	4	4	Many
Number of header lines	1	7	4	1[a4]
Auto page number	Yes	Yes	Yes	No
Auto system date	No	Yes	No	No
Center lines	No	Yes	Yes	No
Variable spaces after header	No	Variable	0-9[a5]	No
Automatic column headers	Yes[a6]*	Yes	No	Yes[a6]*
Number of lines per record	1	2	9	1
Blank lines between records	0	Variable	0-9[a5]	Variable
Truncate field data	Yes	Yes	No	No
Suppress trailing blanks	Yes[a7]	Yes	Yes[a7,a8]	Yes[a7]
Number fields include comma	Yes	Yes	No	No
Text in detail lines	No	Yes	Yes	No
Conditional data print	No	Yes*	No	No
Prints to screen	Yes	No	Yes	Yes*
Prints deleted records	Yes*	No	No	No
Speed	V. slow*	V. fast*	OK*	Slow*
Rerun ease	Good	Best[a9]	Good[b1]	Good
Bold in text	No	Yes	No	No
Variable page length	Yes	No	Yes	Yes

See page 94 for chart notations

of a field as a criterion — this is similar to "*" and "?" options in DOS.

Once you've found a record, what can you do? You can see the next record which meets the criteria. Some allow you to see the previous record which meets the criteria. Some print the record with a single keypress, helpful when building a hardcopy file. (File Fax's print option does work; use "CTRL ," rather than the key given in the manual.) Data Perfect and FileManager allow you to find and change a record in one operation. In the others you search for a record, write down its record number or key field value and then go to a change/update module to change the data in that record.

Only Data Perfect will change or delete in a single pass all records which matched specified criteria. This is a very powerful feature. Suppose our Little League roster includes players' ages. If the data base includes a birthdate field, you could run global changes once a month to say "If birthday is greater than 1/1/83 but less than 4/1/83 increase the age by one." Global delete will prune your customer list by removing all records with a total sales amount below a certain amount. Powerful!

The programs vary considerably in speed of searches. The chart shows speeds in a test search through a file of 50 records on the key field, which is the fastest way. Time required to search on non-key fields is given on a per-record basis. Data Perfect's searches are instantaneous because all records are in RAM. The others must read a disk for every record. Data Perfect's extra power, speed and design make it clearly superior for reviewing and updating.

SORTS

Suppose you've entered records for 200 pieces of art and want to see the list sorted by artist, and for each artist, by year purchased. This is a two-level sort. Data Perfect sorts to four levels. This is adequate for most applications. FileManager is limited to three levels, and permits only 24 "criteria" characters. Worse, memory limitations will restrict many sorts.

Some systems do only ascending sorts (1, 2, 3 . . .). Only CCA will mix both ascending and descending sorts (1 . . . 3, 2, 1). A sort on only the first few characters of a field is permitted by some of the systems. All programs accept sort criteria easily, but File Fax's sort criteria are awkwardly placed at the file-definition level.

continued on next page

FULL-SCALE DBMS	CCA DBMS	DATA PERFECT	FILE FAX	FILE MANAGER+
VERSION	4.1	1.3	Release 2	4D
FILE HANDLING				
Backup system	Yes	Yes*	No*	No*
Recover deleted records	Yes	No	No	No
Merge from other files	Yes	Yes[m]	No	Yes
Create subfiles	Yes[b2]	Yes	No	Yes
ERROR RECOVERY				
Error message clarity	Good	Excellent	Nice	Fair
Recover from printer errors	Poor[b3]	Excellent	Poor[b3]	OK
Recover from disk errors	Good	Excellent	Poor[b4]	Fair[b5]
Recover from power failures	Excellent	Excellent	Poor*	Good

See page 94 for chart notations

Sort speeds differ remarkably. For sorting 50 records on a non-key field, FileManager's 54 seconds was very fast. Data Perfect was slowed down by disk swapping because it reads records from the old file, sorts them, and outputs them to a new file. Since all records fit in Data Perfect's memory, I consider this a design fault. File Fax sorts so slowly the vendor suggests you let it sort overnight! And, since it writes the new file over the old one, you run a substantial risk of data loss (keep that backup handy).

I think Data Perfect's flexibility is worth its slower sort speed, compared to FileManager's fast, but very restricted, sort. If you really need more than four levels, CCA sorts very capably.

REPORTS

You'll often use your DBMS to produce labels or lists of records. The report-writer section of a good DBMS should let you design reports the way you need them.

Reports can reorder fields, omit fields, and, on some systems, compute new fields. Data Perfect and File Fax give you a full screen layout similar to the final printed report. Both have horizontal scrolling so you can see all columns (40 at a time). File Fax's layout system for reports is superb. Using "page flipping" (an ultra-fast way to change screens), you skip between the file-definition screen and the report-layout screens, tagging fields as you need them.

When computed fields are used in reports, but not included in the file, they don't consume valuable disk or memory space. Unfortunately, two systems omit this powerful feature.

Similarly, a subtotal feature gives a subtotal on any numeric field whenever a specified field changes value (a "control break"). Systems which restrict subtotals are often inappropriate for a given job. A really flexible subtotal system allows you to print blank lines when a subtotal appears, change pages at subtotals (e.g., a new page for each department) and print a description on the subtotal line.

The maximum report width is shown in characters-per-line. Some systems will save only a few report layouts per data base. This could restrict you if you plan many alternate reports.

Headers are lines at the top of each page which identify the report and contents of each field. Auto-page-number and system-date put these values in the header. A center-line feature puts your headers in the center of a page for a professional look. Some DBMSs automatically print field names at the top of each column. CCA and FileManager do this but do not allow you to design special column headings — inflexible.

Some systems will print a record on more than one line, a feature necessary for reports from long records. Truncating an alphabetic field squeezes more on a line, and suppressing trailing blanks prints fields without gaps.

All the systems except FileManager allow you to choose the number of decimal places printed on a report. File Fax carries this further by expanding the size of the "total" field as required to hold larger numbers and to change its decimal position. A nice touch.

Although part numbers, Social Security numbers, phone numbers and similar data are generally printed with dashes and parentheses, these symbols are rarely kept on the file. A good report writer will insert them easily. Data Perfect's conditional-data-print prints different constants in a field depending on the value in another field. For instance, a report comparing budget to actual could print "overspent" if the cost exceeded budget.

Most systems preview a report for you by printing it on the screen. With FileManager, you can choose to see only the first 40 columns and, therefore, prevent wraparound. Only CCA will print deleted records, a nice audit feature.

Print speed tests for the four systems were not strictly comparable because different reports printed subtotals differently. CCA prints about half as fast as an Epson printer can go, and FileManager at a bit less than printer speed. File Fax kept up with the printer. The real speed demon was Data Perfect. Feeding my Microbuffer, it output a two-page report in 10 seconds!

All of the systems make it easy to run a second copy of a report. Bold text, emphasis of a particular field, is a nice feature found on Data Perfect. That system, however, restricts page lengths to 11 inches per page. All of the systems did a good job of printing labels in a format designed by the user, but labels could *not* be produced more than one across.

continued on page 92

PAYROLL SOFTWARE FOR THE ATARI® 800™

ATARI®

Miles Payroll System™ is an advanced and comprehensive payroll accounting system designed for businesses today. Cumulative totals are maintained for each employee, as well as complete reporting, check writing, and W-2 reporting. Some features include:

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$179.95. Requires 32K and two Atari® 810™ disk drivers. Payment in U.S. funds required with order. California residents add 6.5% sales tax. C.O.D. or prepayment only. Dealer inquires welcome.

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Speed up program development, loading, execution, and copying time by reading disks up to 3 times faster. Complete compatibility with existing software, with faster disk initialization, and reduced wear on the disk drive mechanism. No soldering or trace cutting required, complete installation instructions included, or contact your dealer. Diagnostic program included.

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User friendly program to generate source disks with custom track format. Format is specified on a per track basis. Examples of usage and interpretation of results are included. This system requires a more advanced level user.

HAPPY 810 ENHANCEMENT WITH SINGLE DRIVE HAPPY BACKUP	$249.95
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*ATARI 810 is a trademark of ATARI Inc.

IT'S ABOUT TIME

by G. Herzenstiel



Can your child read both clocks on the right? Many children will go out of their way to read a digital clock instead of trying to read the standard clock. In this program your child can learn to read a standard clock along with a digital clock.

- Two learning units and a game
- Requires 1 joystick

1:20

Recommended for grades K-2

ATARI cassette, 16K	$20.00
ATARI disk, 24K	$25.00

BULLS and CLEOTS

by B. Belian



A game that tests your logic against the computer. Can you enter the four digits that the computer is thinking of in the correct order? The computer will give you clues after every entry. This "mastermind" type game is a challenge to young and old alike.

- Plays on three different levels
- Play with a friend (computer chooses digits)
- Play against the computer feature



Recommended for ages 9-90

ATARI cassette, 32K	$20.00
ATARI disk, 32K	$25.00

T.H.E.S.I.S.

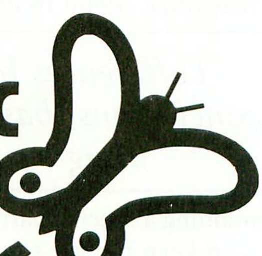
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FILE HANDLING

Each of the systems manipulates files several ways. Extra copies of the program and data disks, known as "backups", should always be available to protect from loss. The CCA disk can be backed up with standard DOS commands. Data Perfect can be backed up with sector-copying programs such as Superdup. Although you cannot back up File Fax, the vendor will sell you a backup copy for $20. FileManager is copy-protected, but friends report that Synapse has always supplied a duplicate disk when the original, damaged disk was returned. The FileManager disk contains a copy of the system on the flip side, so you already have one backup copy.

Only CCA lets you automatically re-insert deleted records without retyping the records. Most of the systems will take two versions of a file and merge them into one file. Data Perfect's system almost requires two drives to do this, however.

It is often useful to create a subfile containing a specific part of an original file, to keep the file from outgrowing your computer. Most of the systems generate subfiles. Only Data Perfect allows you to delete the copied records from the original file in a one-pass operation. The other systems require you to delete the records individually.

ERROR RECOVERY

All potential errors were not tested, but some observations are possible. Even when errors were detected, the error messages on some systems didn't clearly explain what you did wrong. Requesting a printout without making the printer ready, could "lock up" some programs. Some systems locked up completely on disk errors, requiring a complete power off/on cycle and loss of some input data.

Generally, the systems present little risk of data loss due to power failure. File Fax, however, writes records to the disk as you enter them but doesn't build a "pointer file" until you exit the module. Power failure during data entry therefore loses all the records added during the session. The other systems lose only the current record.

SUMMARY

Although it's impossible to provide specific guidance, a selection process can be suggested.

Prepare tentative file definitions and estimate record and field sizes for the applications you expect to automate. Examine the charts to see which systems match your jobs. After eliminating clearly inappropriate DBMSs, compare detailed features to choose a specific program to *test*. Make sure that it will do what you wish, operate the system for several hours at a dealer. You may also wish to consider some of the smaller DBMSs if they would fit your need.

Differences between the systems lead to some conclusions based on my personal judgements after using each system on several test files. Assuming that the program provides the basic capabilities you require, several outstanding advantages/disadvantages of the systems are:

Differences between the systems lead to some conclusions, based on my personal judgements after using each system on several test files.

CCA — Consider this especially if you are an experienced BASIC programmer with some specialized needs, or if you wish to use Percom double-density drives.

Data Perfect — This is the most powerful and flexible DBMS reviewed, yet one of the easiest to use. Its outstanding report features, global change capability, and computed fields probably outweigh its frustrating manual, especially if you have access to a second disk drive.

File Fax — Outstandingly easy to use, this is the system for applications requiring large numbers of records. However, be sure you don't have to change your data-base definition (you'll have to retype the data) or sort your data often (you'll grow old waiting).

FileManager + — Consider this system if you plan to merge data-base records with the Text Wizard word processor or plan to use the RAM-DISK. Otherwise, its limited record capacity and dearth of features suggest purchasing Data Perfect instead.

THE VENDORS

CCA DATA BASE MANAGEMENT SYSTEM
Custom Electronics, Inc.
238 Exchange Street
Chicopee, MA 01013
413-592-4761
List price $99.50

DATA PERFECT
LJK Enterprises, Inc.
P.O. Box 10827
Saint Louis, MO 63129
314-846-6124
List price $129.95

FILE FAX
TMQ Software, Inc.
82 Fox Hill Drive
Buffalo Grove, IL 60090
312-520-4440
List price $129.00

FILE MANAGER +
Synapse Software
5327 Jacuzzi Street—Suite 1
Richmond, CA 94804
415-527-7751
List price $99.95

continued on page 94

NOTES

- * *See text.*
- a *Requires swapping system and data disk.*
- b *Requires data disk swapping for backup or file conversion.*
- c *Supports Percom double density mode. Could use BIT-3 80 column with user modification.*
- d *Computed by reviewer.*
- e *Second and additional drives hold 1135 records.*
- f *With 4-digit key field.*
- g *Escape kills data except in report design.*
- h *Return used to select some choices but "S" used in other areas.*
- i *Uses Function keys in different ways but always well prompted.*
- j *Checks for allowable data after return.*
- k *Checks for allowable data at keypress.*
- l *Manual designed for non-Atari users — requires some translation.*
- m *Requires two drives or 2 diskette swaps for each record.*
- n *Allows numeric constants via computed field.*
- o *Can be done by specifying field with two decimal places.*
- p *Maximum 254 characters in all formulas.*
- q *Requires setting parameter for full record at data base level — inflexible.*
- r *Requires setting parameter for specific fields at data base level — inflexible.*
- s *Supports position-specific and "anywhere in field" wild cards. Similar to DOS's ? and * functions.*
- t *Supports "anywhere in field" wild card and "not in field" similar to DOS * function.*
- u *Next and previous records shown which match criteria.*
- v *After finding record, can update in another mode.*
- w *Limited to 24 characters total.*
- x *Can add results of a sorted file to the end of another file. Requires DOS manipulation of sorted file.*
- y *Required several disk swaps.*
- z *Up to 254 characters of formulas.*
- a1 *Must be key field only.*
- a2 *Produces totals, no subtotals.*
- a3 *Prints a line of dashes to set off subtotals.*
- a4 *Limited to 37 characters.*
- a5 *Set at data base level.*
- a6 *Prints field names as column headers.*
- a7 *For label reports only.*
- a8 *Once set, trailing blanks removed from all fields — inflexible.*
- a9 *Can choose to rerun only specific pages.*
- b1 *Resorts pointer file for each run. Usually fast sort.*
- b2 *Limited to 30 records per pass.*
- b3 *Can't escape without readying printer or cold boot.*
- b4 *Some disk errors require cold boot.*
- b5 *Cannot escape from some file name errors.*

drive system. The best way to beat this delay is to copy the program on one side of a diskette and keep your data on the other side of that same diskette. MMG's copy protection scheme, however, won't let you do this.

CAPACITIES

Note that **File It 2+** comes with predefined, 80 character records and that each of its prepared systems presents a different file structure which cannot be altered. The maximum number of records was not easily determined for each of the systems. It appears to be at least 300 records, which was the maximum for File It in a 48K machine. Home File Manager, however, uses variable length records so the maximum number of records available depends on your data. Unfortunately, the program gives no indication of percentage full.

GENERAL INFORMATION

The two APX and File It systems are written in user-modifiable BASIC. File It 2+ is particularly open to change since it's a collection of running programs with code modified for specific purposes. You'll need to be an accomplished programmer to change more than the rudiments in any of these systems, and you *may have to* modify the programs. Several, particularly APX 20134, failed due to program errors.

MMG's documentation is too short to be fully useful. File It is long because it's really covering several systems. Although I reviewed a preliminary copy, an index in the final version will make it easier to use.

DATA BASE DEFINITION

Since Home File Manager and File It records are predefined, you can't change their file definitions. The rest of the systems prompt you to define a file based on stacked questions such as "Enter name?". The function to reorganize the data base allows you to change fields in a file without retyping the data. File It will rearrange zip code fields in a pre-determined way, hardly a file reorganization. APX20134 allows addition of a field to the end of a record but no field insertion or reordering.

SMALL DMBS

	APX-DATA BASE REPORT 20134	APX-DATA MANAGEMENT 20059	FILE IT 2+	HOME FILE MANAGER	MMG FILE MANAGER
VERSION	20134	20059	2+	CX415	Not Given
HARDWARE					
Minimum Memory	40K	32K	24K	16K	40K
Need for second drive	High	Low	High	None	High
CAPACITIES (MAXIMUM)					
Number of fields	10	8	6[a]	18	10
Record size (characters)	255	140	80[a]		270
Field size (characters)	100	30	N/A[a]	38	27
GENERAL INFORMATION					
Single load	No	Yes[b]	No	Yes	No
Confirm desctructive acts	Good	Fair	No	Good	Yes
User modifications	Yes[c]	Yes[c]	Yes[c]	No	No
DOCUMENTATION — OVERALL EASE	Very good	Very good	Fair	Excellent	Fair
DATA BASE DEFINITION					
Ease of defining files	Poor-no names	Good	N/A[a]	No definition	Good
Print out file definitions	Yes	No	No[a]	N/A	No
Reorganize data base	Yes[e]	No	No	N/A	No
FIELD TYPES					
Decimal positions	Yes	$/¢	No	No	No
Excess field length warning	Yes	Yes	No	Auto wrap	No
Numeric	Yes	Yes	No	No	No
Date	No	Yes[f]	No	No	No
DATA ENTRY/UPDATE					
Input form	No	No	No	Yes	No
Input editing ease	Poor	Poor	Poor	Excellent	Good
Update ease	Fair	Good	Good	Excellent[g]	Good
Prompts	Good	Good	Fair	Excellent!	Good
Find and change	No	Yes	No	Yes	Yes

See page 100 for chart notations

None of the programs support computed fields. Since the Home File Manager is primarily a text card, it doesn't provide numeric-only fields. But, then neither do two of the others.

DATA ENTRY

Only Home File Manager's "card" is a form for data entry. The rest obtain data by your responses to field-by-field questions. APX 20134 doesn't give you

SMALL DMBS

	APX-DATA BASE REPORT 20134	APX-DATA MANAGEMENT 20059	FILE IT 2 +	HOME FILE MANAGER	MMG FILE MANAGER
REVIEWING / UPDATING RECORDS					
Review by how many fields	All keys	1	0	All	3[h]
Review by range	Yes	Yes	No	No[i]	Yes
Wild cards, part of field	No[j]	Part	No	Part	Part
Print reviewed record	No	No[k]	No	Yes	Yes
Global change / delete	Yes	No	No[l]	No	No
SORTS					
Number of sort levels	10	8	6[m]	Key only	3
Ascending, descending, both	Both	Both	Ascend-ing	Both	Both
Outputs different file	No	No	Yes	N/A	No
REPORTS AND LABELS					
Report layout ease	Good	Good	Standard[p]	Standard[q]	Good
Printer set up strings	No[n,o]	No[n]	Yes[o]	No[p]	Yes[o]
Number of total fields	10	0	0	0	0
Maximum report width	115	119	80	38	132
Auto page number	Yes[q]	Yes	Not tested	No	No
User definable column headings	Yes	Yes	No[r]	No[s]	No[r]
Label program	No[t]	No	Yes	No	Yes[u]

See page 100 for chart notations

field names or any other prompt. When it says "enter field 2", you have to remember what field 2 is supposed to contain. Most do not enable you to edit a prior field without either saving the record and going to a different module, or by retyping the entire record. MMG does allow editing entry data, a strong plus. APX 20134 and File It let you see only one field at a time — awkward.

REVIEWING / UPDATING RECORDS

Some of the systems make it easy to find a record and edit it, others not so easy. APX 20134 is unique in that it will change a field in all records in a file and write out a new file so your old file is not damaged. The Home File Manager's search routine responds to either upper or lower case matches — convenient for a text-oriented system. APX 20134's review is particularly inconvenient since you see only a part of the record at a time. APX 20059 and MMG let you find a record and change it in one operation.

SORTS

All sorts seemed fast. APX 20134 actually writes out a new file but then proceeds to delete the old file. Therefore, although there may be different physical files, there is only one logical file. It's handy to keep a file sorted in different orders, a feature found only in File It.

REPORTS

These systems produce only the simplest reports. Some offer only a standard layout; others can produce simple columnar listings with the fields listed in the order you choose. You can't control column spacing, take subtotals, insert text (except a short title) or compute fields. All of these systems will print at full printer speed (see restrictions in the chart).

FILE HANDLING

All of the system disks except Home File Manager and MMG can be backed up. (You can make a nice copy of MMG but starting the program initializes the disk and wipes it clean. Worse, their protection scheme messes around with memory so that you have to cold boot whenever the program dies.) Data files are best backed up using DOS. APX 20134 provides a backup command, but it deletes the original file if used to back up a file to the same disk. One outstanding feature is the demonstration file provided on APX 20134 and APX 25059.

ERROR RECOVERY

All of the systems except Home File Manager suffered from generally poor error recovery. The APX systems didn't restart after a printer halt unless the printer could be made ready. Recovery from disk errors (such as a write-protected diskette) was problematic at best. Because the two APX programs and File It write only part of a record during data entry, a power failure would lose all records since the last save. MMG also waits until all records are entered to save the "pointer file". It builds a new pointer file upon startup and, therefore, didn't lose records.

SUMMARY

Don't purchase one of these products until you determine that it can handle your "must have" requirements for number of fields, record size, field size, etc.

continued on page 100

PUBLIC DOMAIN SOFTWARE

PUBLIC DOMAIN SOFTWARE

ANTIC is pleased to offer a library of Public Domain Software for the ATARI computers currently comprised of 12 disks. These programs are not yet available on cassette. These disks contain unprotected material from the libraries of ATARI users' groups from around the country.

The potential buyer should note that these programs are sold *as is*. Their usefulness may depend on your experience with the computer. They may contain programming quirks that require some modification. However, all perform reasonably well. Contents of the disks may vary slightly from the published description due to unforeseen circumstances, but each disk is filled to reasonable capacity with useful programs of the kind described, and represent an excellent value at $10.00 each, plus $1.50 per order for shipping/handling. Send check or money order (payable to ANTIC Publishing), and disk number(s) to: **Public Domain Software, 600 18th Street, San Francisco, CA 94107.** Allow four weeks for delivery. All orders are sent by First-Class Mail. Please add 6½% sales tax for California residents.

ANTIC GAMES DISK #1

1. Chicken: a great game from ANTIC #1
2. Hangman: the traditional word game
3. Creation: a version of Life
4. Reverse: order of string numbers
5. Monopoly: computerized!
6. Lunar lander: select terrain (stick)
7. Zonex: hidden color patterns in grid
8. Clewso: detective adventure, graphics

ANTIC GAMES DISK #2

1. Speed Demon: from ANTIC #4
2. Guy' Grid Game
3. Deathstar: from ANTIC #2
4. Blackjack: Vegas rules
5. Civil War: a strategic simulation
6. Artillery: firing strategy game
7. Super Wumpus: text adventure

ANTIC GAMES DISK #3

1. Petals
2. Showdown
3. FROG: from ANTIC #3
4. Draw: Guy Hurt
5. Plus Zero
6. Collisi, and more

NEW

ANTIC GAMES DISK #4

1. Vultures: from Stan Ockers
2. Castle Hexagon: also by Stan Ockers
3. Adventure: The remainder of the disk contains an adventure game program which you can play, or you can use the program to write your own adventure. Instructions included in program.

NEW

ANTIC GAMES #5

1. Bats: who else? Stan Ockers, from ANTIC #5
2. Steller Defense: from ANTIC #6, slightly improved.
3. Yahtzee
4. Mastermind
5. Hamurabi: the classic simulation
6. Slalom: become a master schusser
7. Couch: analyze yourself
8. Aceyducy & more

ANTIC PHOTO GRAPHICS

Digitized Photos

ANTIC UTILITY DISK #1

1. Doc: program allows you to accompany programs with separate documentation on disk
2. Microassembler: allows you to create USR routines-assembler, more
3. Assembler-Editor: BASIC, slow but versatile
4. Num: automatic line numbering utility in BASIC
5. Memtest: runs without BASIC cartridge, to test all memory
6. Color: 128 colors at once
7. Printnop: connect parallel printer from jacks 3 & 4

ANTIC UTILITIES DISK #2

1. Bubble Sort: from ANTIC #4
2. Typo: from ANTIC #3
3. Home inventory
4. KEY 6: Cipher coding
5. Renumber
6. Compare: listings for differences
7. SUPER: menu
8. Modem
9. RT clock & more

NEW

ANTIC UTILITIES DISK #3

1. Disassembler: from ANTIC V.2,#1
2. Tiny Text: from ANTIC #6
3. GTIA text window: from ANTIC V.2,#1
4. Label: disk label on Epson
5. Set up printer: sets up MX80 for Visicalc
6. Autotype: convert USR code to string
7. Autodata: convert USR code to DATA statements.
8. Keyboard: tutorial & more

ANTIC GRAPHICS DEMO #1

1. Spider: from ANTIC #3
2. Rainbow
3. Horses
4. ATARI logo
5. Oxygen
6. Spiral
7. Pretty
8. Message and more

ANTIC MUSIC DISK #1

Requires Music Composer Cartridge

1. Prelude
2. Joplin
3. In My Life
4. Star Trek
5. Daisy
6. Greensleeves
7. Yellow Submarine, and many more

ANTIC GR. & SO. DEMO #1

1. Graphic
2. Draw
3. Rainbow
4. Tune Rite
5. Etch Sketch
6. Baby Pro Sound and more

ANTIC presents these programs in diskette form for the convenience of the ATARI community, in the belief that all of the programs offered are in the Public Domain and that no proprietary interests or rights to these programs are claimed by anyone. These diskettes are not copyprotected, nor does ANTIC claim rights to the programs themselves. The price of the diskettes is based on the cost of making them available.

ATARI 400/800* UPGRADES
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FASTCHIP - ATARI 400/800* $41.95

FASTCHIP can give you up to three and 1/2 times the speed of the original floating point routines. Atari BASIC uses these routines for almost everything. FASTCHIP is a pin compatible ROM that replaces the original. It can be installed in minutes, and is a permanent replacement for the original rom. There are no modifications, cuts, or wires to add. FASTCHIP comes with a 90 day full warranty.
Some reference times (in seconds).
Function executed 1000 times in loop.

FUNC	OLD ROM	FASTCHIP	FUNC	OLD ROM	FASTCHIP
ATN	128	62	CLOG	120	30
LOG	129	33	EXP	112	34
^	236	65	COS	84	33
SIN	85	30	SQR	135	55

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RAMROD also addresses the 4096 byte block of memory that is not currently accessible in the system. It also is switch selectable and may be used as RAM, ROM, or a combination. This ram is usable by software such as SPREADSHEETS, WORD PROCESSORS, and certain LANGUAGES to mention a few, without modification to the existing operating system. Complete with instructions and recommended modifications. One year warranty.

PLUS, every board comes with OMNIMON!, a resident machine language monitor written by David Young, author of DISKSCAN. It features many powerful debugging commands like display/alter memory, disassembler, printer and disk interface, etc. The disk interface has many features, including the ability to access single or multiple sectors in sequential or linked mode. And you can call it up at any time. A sophisticated yet simple program to use.

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WITH 12K MEMORY (4K RAM, 8K EPROM) $189.95
EPROMS-2732,4Kx8,350 ns. $10.00

OMNIMON! - ATARI 400/800* $89.95
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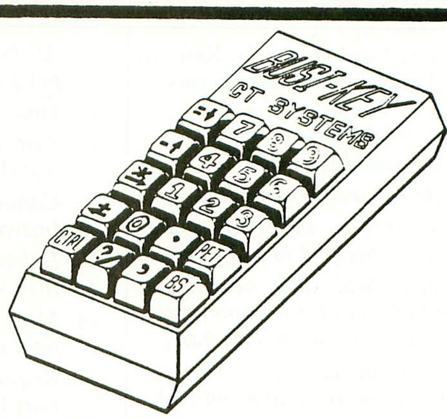
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Although it's the simplest of the systems, the Home File Manager is also the best implemented by far. If you can use a simple index-card system, searchable on any field, but without numeric or columnar reporting, I'd recommend it highly.

APX 20134, Data Base / Report Systems, offers a reasonable degree of flexibility in its ten fields, generates totals for numeric fields, reviews and prints values in any one of its ten fields, and has global change / delete — powerful features not matched by the other systems. It showed a disturbing tendency to fail on some rarely-used operations, however, and data entry is difficult because you see only part of an untitled record. Yet, if you need arithmetic features, it's your choice.

APX 20059 Data Management System handled data entry a bit easier than APX 20134, but offered lower capacities and fewer features. Although APX 20059 is not quite as good as MMG at reviewing and editing records, it offers a better report writer.

MMG File Manager is the only system that attempts to do mailing labels. It removes "trailing blanks" and generally did well on them. It seemed to be a "smoother" program and offered easier record entry and updating. Lack of numeric operations and the inability to print columns as you need them make it less useful than APX 20134 for many applications.

File It 2 + is an enigma. The package includes a program to print diskette labels, a menu program suitable for user disks which could be very useful. Although the author has presented an interesting set of related programs, the data base seems too restricted for most users. For instance, with only six fields, the record format doesn't even include a telephone number field. The author suggests keeping two files, one for ZIPs and one for phone, with all sorts of manipulations to update and move records around. On the other hand, the disk also includes a handy-looking financial recording program and a graph generator.

Leaving aside Home File Manager (unless it fits your purposes) and File It (unless you'd like some of the extra programs), the choice is between the APX systems and MMG. If you need arithmetic totals or long fields, but don't need labels and can endure awkward data entry, stick with APX 20134. If you want better input screens, labels, and easy editing, but don't need fancy reports, MMG is a well-implemented system. Somewhere in the middle is APX 20059. It won't produce labels, however.

Now, how's that for a decision tree?

NOTES

Programs are listed alphabetically. Refer to full-scale article for definitions of terms.

- a *All field names and sizes fixed.*
- b *Except sort loaded separately.*
- c *Source code not well commented.*
- d *Reorganize only to move zip code fields, etc., as specified in program.*
- e *Cannot delete field; adds new fields only at end of record. On some tests, failed with destruction of data base.*
- f *Checks for valid date; i.e., 13 . . . would reject as there is no month 13.*
- g *Includes undo and insert line.*
- h *All fields eligible for searching, three per pass. First 5 characters only.*
- i *Finds upper and lower case "hits."*
- j *Part field allowed for last field in search criteria.*
- k *Cannot see on screen, then print. Instead, will go directly to printer.*
- l *Deletes require entering * in field one, then saving file.*
- m *Must enter field positions rather than field numbers.*
- n *Requires modification to code to support EPSON.*
- o *Graphic characters in title can be used for some printer setups.*
- p *Prints in italic on EPSON w/Graftrax.*
- q *Also allows starting page number to be input.*
- r *Prints 1 record per line with all fields in original order.*
- s *Prints only record by record, one field per line.*
- t *Allows "vertical format report" which prints one field per line. If properly set up, could be used as a label.*
- u *According to manual, cannot place two fields on the same line if used as labels.*

THE VENDORS

APX — DATA BASE / REPORT SYSTEM (APX-20134)
APX-Data Management System (APX-20059)
Atari Program Exchange
P.O. Box 3705
Santa Clara, CA 95058
800-538-1862
800-672-1850 (Calif.)
List Price: $22.95 each

FILE IT +
Swifty Software, Inc.
64 Broad Hollow Road
Melville, N.Y. 11747
516-549-9141
List Price: $49.95

HOME FILE MANAGER
Atari, Inc.
P.O. Box 427
Sunnyvale, CA 94086
List Price: $49.95

MMG FILE MANAGER
MMG Micro Software
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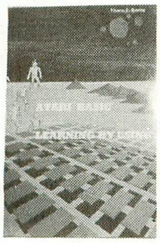
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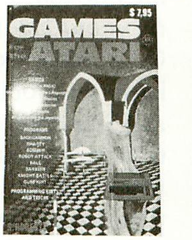
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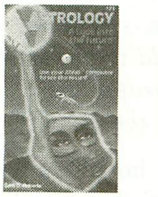
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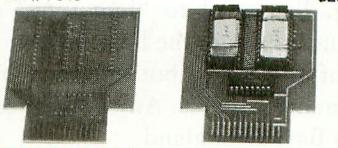
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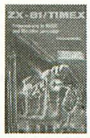
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ATARI CLINIC

by STEVE SWITZER

Q. I have purchased three of the latest Thorn EMI cartridges: Soccer, Jumbo Jet, and Submarine Commander. I also have Star Raiders, Firebird, and Missile Command on cartridge. The Thorn EMI carts have good sound and a good picture, but the picture has "noise bars" at the top and bottom of the screen when played on my ATARI. The other carts on my ATARI play perfectly (no "noise bars"). The Thorn carts play perfectly on my friend's ATARI, so I can't figure out what's wrong. I've tried to "fine tune" my computer through the little hole in the base of the deck, but this has only made matters worse. Any suggestions?
—Cris Baylis, England

A. The "noise bars" are probably caused by radio frequency (RF) interference from some source. This might be from the Thorn cartridges, or from your computer, or a combination of the two. It is very possible that the Thorn carts are EPROMs rather than ROMs. Many companies first bring their products out on EPROMs because they can produce these as soon as the programmer is finished, while it still takes some time to mask out a ROM for a cartridge. If the EPROM is improperly shielded, you could be getting RF from the cartridge itself. It could also be caused by the decoupling circuitry in the cartridge. One reason your carts might work on your friend's machine, but not your own, is that the RF shielding on your machine may not seal properly, and this could allow RF to bleed into the machine. The peculiar combination of your leaking ATARI and inadequately shielded cartridges could be causing the problem.

Q. I would like to compliment ANTIC on the good job it's doing, but I'd like to see a more technical column. It seems to be impossible to get a schematic of the output ports of the ATARI. Thanks to you we have a small idea of how they work, but not how they connect on the inside. Many of us would like to add our own modems or speech synthesizers, but we need the internal diagrams. Where can we get these? **—Ray Ives, CA**

A. Your timing is good, because this column is going to be in ANTIC regularly to help you solve problems you may be having with your computers and related products. About the schematics, they should be available at your computer shop under the title of Technical User Notes, Atari part #C016555. If your store doesn't have them, drop us a line at Electronic Fantasy, 52 S. Linden Ave. — #1, South San Francisco, CA 94080. We can get them for you.

Q. I purchased my ATARI 800 about six months ago. I thought it was a good value, and I only needed a cassette drive for storage at that time. Lately I have been considering a disk drive. The question is, which one to buy? I see that the Atari 810 can be bought for about $400, and that the Percom double-density master drive costs about $600. Is the Percom worth the extra money? Is the Atari 810 reliable? **—Glen Harrod, NY**

A. I hope I can be objective about this. In my opinion, both the drives are very good. Reliability problems with the Atari 810 have decreased steadily in the last year or so, and I now consider it very reliable. If you only want one disk drive, I recommend the 810. If anything does go wrong with it, you should be able to get it fixed right in your own back yard. The Percom must be sent away to the factory. But if you are going to get two or more drives, then the price of the Percom master and one Percom slave is about the same as two 810s. This combination has the advantage of double-density mode. There are several new drives on the horizon. It might be wise to check them out before making a decision.

Q. In response to Bruce Fuerbringer's letter on problems with the Basketball and Star Raiders cartridges, I happened to notice a letter in another magazine from a person whose serviceman said that screen inversion was due to undocumented hardware bugs. He further stated that having a full 48K memory might invert the display, or maybe faulty ICs in the cartridge ROM are the culprits. I have never had this problem, but the situation sure sounds confusing. **—Mike Sinatra, PA**

A. This problem is very common, but it is not caused by the cartridge, and has nothing to do with full memory or undocumented hardware bugs. About two years ago Atari sold a number of 800s with faulty ANTIC chips. The most common symptom was an inverted playfield with the Star Raiders game. The proper correction is replacement of the ANTIC chip.

Q. I recently bought an Atari 5200 video game machine, and I've had to take the controllers in for repair twice already. Now the warranty has expired, and I'm afraid I'll have to spend $20 every month or so to keep the controllers working. What should I do?

A. The 5200 is a very good machine and has developed very few problems. The controllers, on the other hand, are not so sound. Atari is aware of this, and has sent newly designed innards to the service centers to replace the old parts. The company has also extended the warranty on the controllers (not the 5200 itself) to June 30, 1983. So don't "open" your controllers, even if you think your warranty has expired, until after that date. Take them to a service center for repair. Personally, I strongly advise you to stay out of the controllers completely, because they are very tricky inside.

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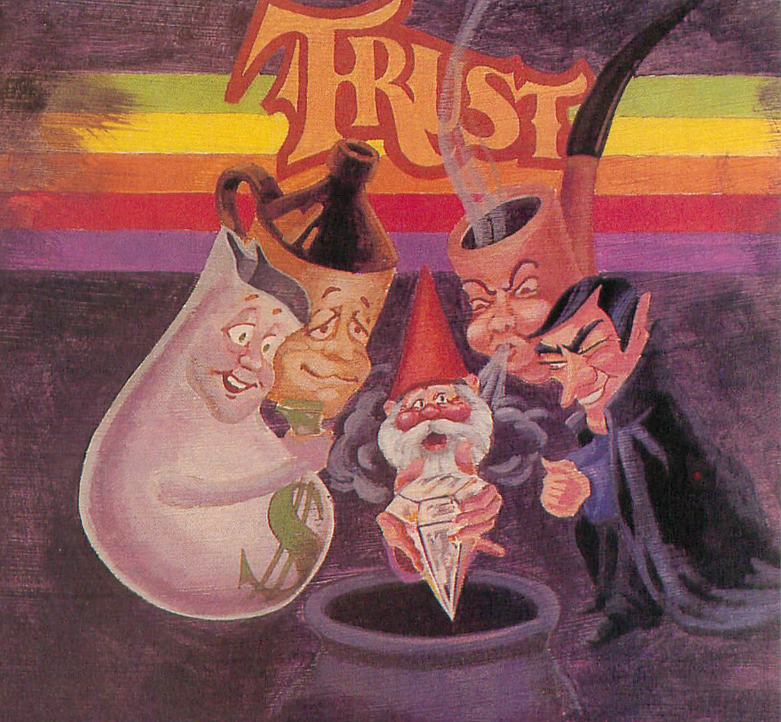
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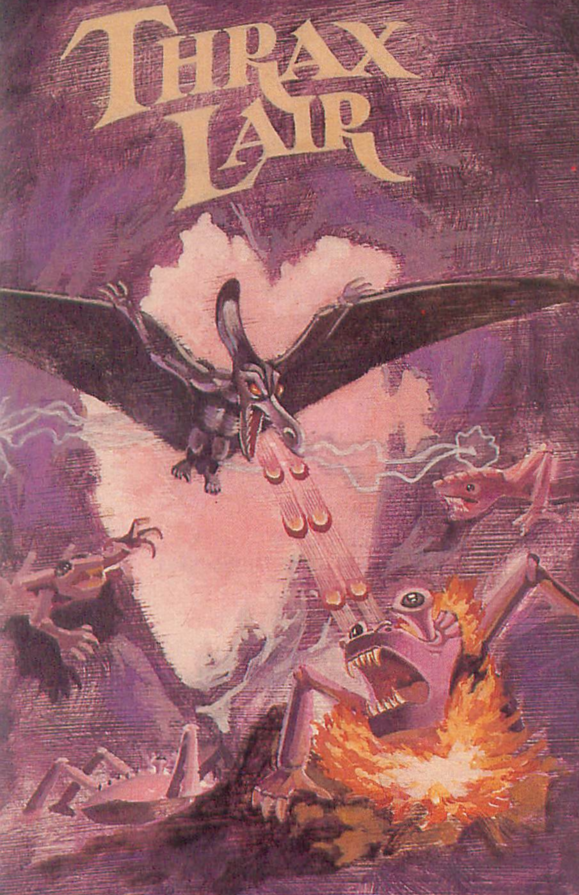
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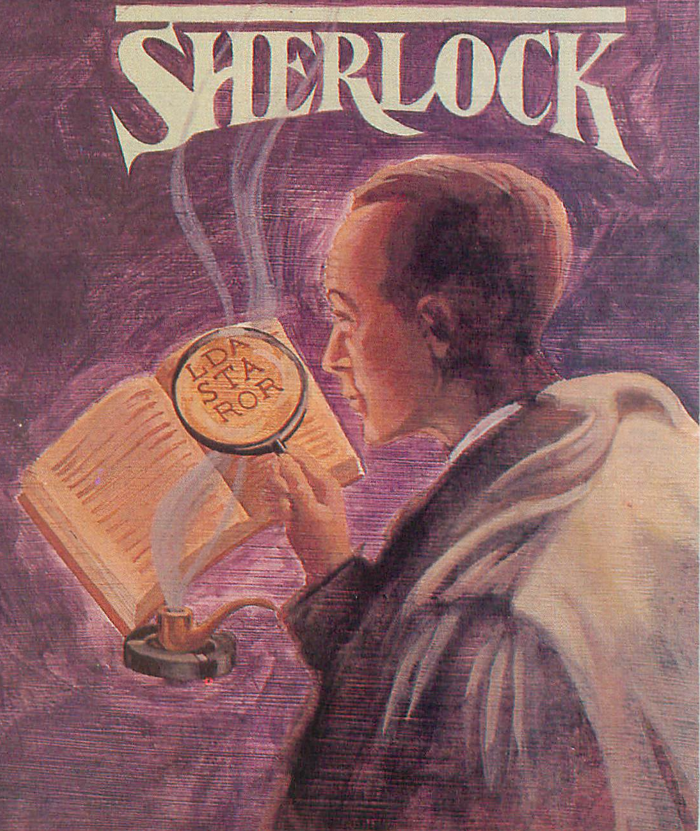
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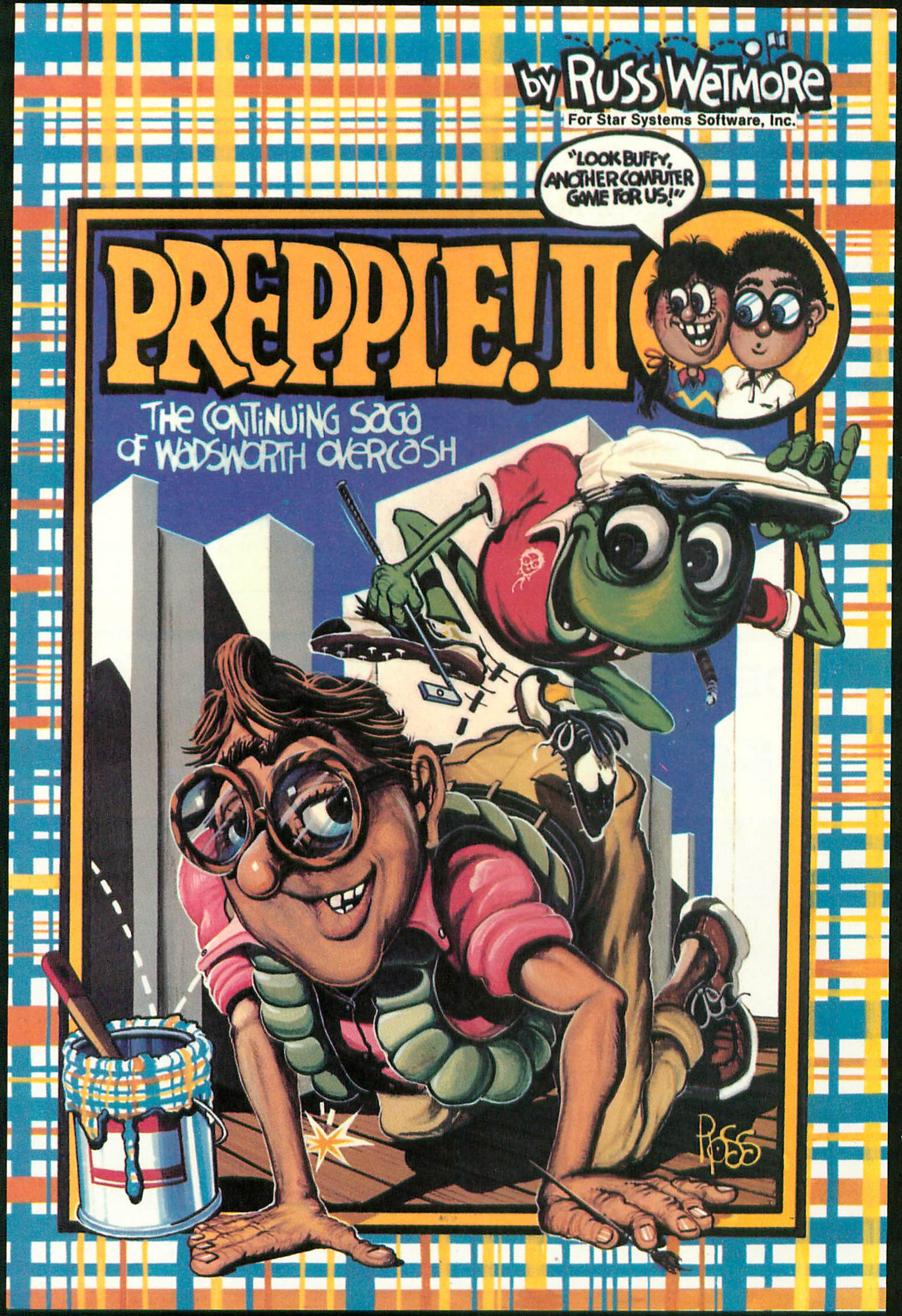
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